Sa 1/2/v.2

DEPARTMENT OF TRANSPORTATION

COAST GUARD

MARINE SAFETY MANUAL
VOLUME II

MATERIEL INSPECTION

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UNITED STATES COAST GUARD

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U.S. Coast Guard
Washington, D.C. 20593
(202) 426-9776

COMDTNOTE 16000
6 JAN 1982

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- COMMANDANT NOTICE 16000

CANCELLED: 2 JUL 1982

Subj: CH-9 to Volume II - MATERIEL INSPECTION of the Marine Safety Manual, COMDTINST M16000.3

1. PURPOSE. This Notice transmits a change to Volume II of the Marine Safety Manual by revising part 44-2 (Oil Pollution Prevention Regulations), and by deleting parts 30-4 (Vessel Subdivision and Stability) and 39-2 (Implementation of the Pollution Prevention Regulations Concerning Vessel Design and Operations) and subparts 36-3-5 (Discussion Concerning the Intent of 33 CFR Part 154 - Large Oil Transfer Facilities) and 36-3-10 (Discussion Concerning the Intent of 33 CFR Part 156 - Oil Transfer Operations) of the volume.

2. DIRECTIVES AFFECTED. None.

3. DISCUSSION. Part 44-2 has been revised to reflect the scope and intent of the revised oil pollution regulations, 33 CFR 154-156. The impact of these revised regulations on vessel and facility design and operations is discussed in this part, which supersedes previous guidance located in part 39-2 and subparts 36-3-5 and 36-3-10. The material in part 30-4 has been incorporated in part 65-7 (Volume IV).

4. ACTION.

a. Remove and insert the following pages:

Remove	Insert
30-4:1 through 30-4:4, CH-1	-------
39-2:1 through 39-2:7, CH-1	-------
44-0:1	44-0:1, CH-9
44-2:1	44-2:1 thru 44-2:19, CH-9

b. Make the following pen-and-ink corrections:

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	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
A																										
B		4	15		5		2	*		5				200	1		2	1								
C					*		2		*			2	*												1	
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READEX FICHE

4. b. (1) Revise subpart 30-3-1 to read "A discussion of the proper procedures for the submission of required plans is contained in Chapter 60 (Volume IV) of this manual." Delete all of subparts 30-3-5 and 30-3-10.

(2) In paragraph 30-6-5B(2), second sentence from end, revise sentence to read "The responsibilities of the OCMI and inspector in the enforcement of the Load Line Regulations are described in parts 65-7 (Volume IV) and 76-1 (Volume V) of this manual."

(3) In section 30-10-20D, last sentence, revise to read "... criterion (see part 65-7, Volume IV of this manual)."

(4) In section 30-10-30A, second paragraph, revise last sentence to read "...(see part 65-7 (Volume IV) of this manual for load line requirements)."

(5) In paragraphs 30-10-30C(4) and 30-10-30D(4), revise first sentence of each to read "See part 65-7 (Volume IV) of this manual for load line requirements."

(6) In subpart 32-1-1, revise the second sentence from end to read "See parts 65-7 (Volume IV) and 76-1 (Volume V) for application of load line requirements..."

(7) Revise section 32-3-5E to read "Load line requirements are covered in part 65-7 (Volume IV) of this manual."

(8) On page 36-0:1, cross out references to subparts 36-3-5 and 36-3-10.

(9) On pages 36-3:1 through 36-3:5, CH-1 cross out text of subparts 36-3-5 and 36-3-10; add the following sentence: "See part 44-2 of this manual for discussion of facility design and operations relative to pollution prevention."

(10) On page 39-0:1, CH-1, cross out references to part 39-2.

(11) Revise the Table of Contents for Chapter 30 by deleting the following items: 30-3-5; 30-3-10; Part 30-4 and all subparts therein.

c. Make an entry on the volume "Record of Changes" page.

5. CORRESPONDENCE. Comments and suggestions for improvement of this volume should be submitted to Commandant (G-MP-4/MSM) on Form CG-5122.

J. W. Kime
J. W. KIME
Captain U. S. Coast Guard
Acting Chief, Office of Marine
Environment and Systems

Encl: (1) CH-9 to Volume II, COMDTINST M16000.3

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COMDTNOTE 16000
7 OCT 1981

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COMMANDANT NOTICE 16000 CANCELLED: 7 APR 1982

Subj: CH-8 to Volume II - MATERIAL INSPECTION of the Marine Safety Manual, COMDTINST M16000.3

1. PURPOSE. This Notice transmits a change to Volume II of the Marine Safety Manual by adding Chapter 37 (Inspection of Deepwater Ports) and subpart 30-10-105 (Fishing and Fishery-related Vessels), and by revising Chapter 32 (Inspection and Examination of Foreign Vessels) and parts 30-9 and 30-10 of the volume.

2. DIRECTIVES AFFECTED. None.

3. ACTION.

   a. Remove and insert the following pages:

Remove	Insert
30-9:7 thru 30-9:8, CH-6	30-9:7 thru 30-9:8, CH-8
30-10:1 thru 30-10:2, CH-6	30-10:1 thru 30-10:2, CH-8
30-10:11 thru 30-10:14, CH-6	30-10:11 thru 30-10:14, CH-8
30-10:17 thru 30-10:18, CH-6	30-10:17 thur 30-10:18, CH-8
30-10:29 thru 30-10:30, CH-6	30-10:29 thru 30-10:30, CH-8
30-10:39 thru 30-10:40, CH-6	30-10:39 thru 30-10:40, CH-8
30-10:43, CH-6	30-10:43 thru 30-10:45, CH-8
32-0:1 thru 32-4:3, CH-1	32-0:1 thru 32-4:3, CH-8
37-0:1 (To be developed)	37-0:1 thru 37-1:4, CH-8

   b. Make an entry on the Record of Changes page.

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A																										
B		4	15*		5		2	*		5				200	1		2	1								
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4. CHANGES. Suggestions for improvements to the Marine Safety Manual should be made on Form CG-5122.

Clyde T Lusk Jr
CLYDE T. LUSK, Jr.
Chief, Office of Merchant Marine Safety

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17 AUG 1981

CANCELLED: 17 FEB 1982

COMMANDANT NOTICE 16000

Subj: CH-7 to Volume II - MATERIAL INSPECTION of the Marine Safety Manual, COMDTINST M16000.3

1. PURPOSE. This Notice changes Volume II of the Marine Safety Manual by revising Chapters 31 (Inspection of Equipment and Materials) and 48 (Vessel Inspection Records, Reports, and Certificates) and parts 30-5 (Construction, Conversion, Alteration, and Repair of Vessels), 30-6 (Inspection of Vessels for Certification), and 30-8 (Drydock Examinations), and by indicating pen-and-ink corrections to the volume.

2. DIRECTIVE AFFECTED. None.

3. ACTION.

   a. Remove and insert the following pages:

Remove	Insert
30-0:1 thru 30-0:4, CH-1	30-0:1 thru 30-0:3, CH-7
30-5:1 thru 30-5:8, CH-1	30-5:1 thru 30-5:14, CH-7
30-6:1 thru 30-6:41, CH-1	30-6:1 thru 30-6:52, CH-7
30-8:1 thru 30-8:8, CH-1	30-8:1 thru 30-8:11, CH-7
31-0:1 thru 31-4:2, CH-1	31-0:1 thru 31-4:2, CH-7
48-0:1 thru 48-2:16, CH-3	48-0:1 thru 48-2:20, CH-7

   b. Make the following pen-and-ink corrections:

      (1) In Section 47-1-5C (p. 47-1:3), Section 47-2-1B (p. 47-2:1 and 47-2:2), and Subpart 47-2-15 (p. 47-2:13) change phone number of Commandant (G-MHM-3) to "426-6260."

   c. Make an entry on the Record of Changes page.

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B	*	4	15*		5		2	*		5				200	1	1	2	1								
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4. CHANGES. Suggestions for improvements to the Marine Safety Manual should be made on Form CG-5122.

Clyde T Lusk Jr.
CLYDE T. LUSK, Jr.
Chief, Office of Merchant Marine Safety

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JUN 22 1981

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COMDTNOTE 16000
14 MAY 1981

CANCELLED: 16 NOV 1981

COMMANDANT NOTICE 16000

Subj: CH-6 to Volume II - MATERIAL INSPECTION of the Marine Safety Manual, COMDTINST M16000.3

1. PURPOSE. This Notice transmits a change to Volume II of the Marine Safety Manual by revising parts 30-9 (Inspections Under SOLAS) and 30-10 (Inspection Procedures Applicable to Vessel Types, Classes, and Categories), and by indicating pen-and-ink corrections to the volume.

2. DIRECTIVES AFFECTED. None.

3. ACTION.

a. Remove and insert the following pages:

Remove	Insert
30-9:1 thru 30-9:9, CH-1	30-9:1 thru 30-9:13, CH-6
30-10:1 thru 30-10:29, CH-1	30-10:1 thru 30-10:43, CH-6

b. Make the following pen-and-ink corrections:

(1) Chapter 30 Table of Contents, p. 30-0:3, CH-2 change title of subpart 30-10-50 to read: "Vessels in Immobile Status."

(2) Section 30-8-40D, p. 30-8:8, delete the words "next due to be".

(3) Paragraph 30-14-30(1)(c), p. 30-14:7, delete "(j)"; add a new subparagraph (f), to read: "IMCO Guidelines for Inert Gas Systems, MSC/Circ. 282."

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A																										
B		4	15		5		2	*		5				200	1	1	2	1								
C					*		2		*			2	*												1	
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3. b. (4) Section 30-14-20B, p. 30-14:6, CH-2, add a new paragraph (8), to read: "General. All pressure, temperature, and level switches should be disconnected together with any sensor tubes and inspected."

4. VOLUME STATUS. The following changes to the Marine Safety Manual have been distributed to date:

a. Volume I	CH-7, dtd 24 Jun 80
b. Volume II	CH-5, dtd 26 Jun 80
c. Volume III	CH-2, dtd 17 Dec 80
d. Volume V	CH-5, dtd 08 May 80
e. Volume VI	CH-6, dtd 08 Jul 80

5. CHANGES. Suggestions for changes to the Marine Safety Manual should be submitted on Form CG-5122.

Henry H Bell
Chief, Office of Merchant Marine Safety

Encl: (1) CH-6 to Volume II, COMDTINST M16000.3

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MARINE SAFETY MANUAL

PART 30-9 -- INSPECTIONS UNDER SOLAS

30-9-1. GENERAL

30-9-1A. VESSELS TO WHICH SOLAS IS APPLICABLE

Mechanically-propelled cargo and tank vessels of 500 G.T. and over, and all mechanically-propelled passenger vessels carrying 12 or more passengers, which are engaged in international voyages and which are entitled to fly the flag of a country which is party to the International Convention for the Safety of Life at Sea (SOLAS) are subject to this convention to the extent described therein. In this context, vessels entitled to the flag of the U.S. are those documented or numbered under the laws of the United States, including Guam, the U.S. Virgin Islands, and Puerto Rico. When possessing a current valid convention certificate and complying with its terms, such a vessel is entitled to all of the privileges described in the convention when visiting foreign countries which are also parties to SOLAS.

30-9-1B. EFFECTIVE DATE OF SOLAS 74

The requirements of SOLAS 74 came into effect on 25 May 1980. For convention purposes, a "new" ship is one for which the keel was laid on or after that date. An "existing" ship is one for which the keel was laid prior to that date.

30-9-1C. APPLICATION OF SOLAS 74

By ratifying SOLAS 74 the United States Government, under Article I of the convention, agreed to promulgate all laws, orders, and regulations and to take all other steps necessary to give the convention full and complete effect, and to ensure that, from the aspect of safety of life, a vessel is fit for the service for which it is intended.

Federal navigation and vessel inspection laws are used as authority to enforce the terms of the convention, and no special law is otherwise necessary to apply the terms of the convention. Vessel inspection regulations in Title 46, CFR generally embrace the inspection requirements of SOLAS 74. Thus, vessels in accordance with 46 CFR requirements will be likewise in accordance with the requirements of the convention, other than for radio equipment requirements administered by the Federal Communications Commission (FCC).

For this reason, inspection personnel generally will not need to refer to convention requirements when conducting inspections for certification. However, they shall be thoroughly familiar with SOLAS requirements which may be considered when inspection decisions are made, and particularly when relaxation of normal inspection requirements are at issue.

The regulations in 46 CFR 175-187 (Subchapter T - Small Passenger Vessels Under 100 G.T.) do not reflect the requirements of SOLAS 74, except by reference to the convention. For those Subchapter T vessels operating on international routes, the inspector shall apply SOLAS 74 requirements or recommend that SOLAS Exemption Certificates be issued.

OCMI's certificating small passenger vessels which will be operated on international voyages through other OCMI zones should contact those OCMI's to determine whether additional requirements need be met for certification.

30-9-1D. PREVIOUS SOLAS CONVENTIONS

The SOLAS Convention entering into effect in 1929 was replaced in 1948, in turn in 1960, and again in 1974. SOLAS 74 incorporates by reference the 1929, 1948, and 1960 conventions for existing vessels. In specific instances (e.g., part F of Chapter II-2), modifications are required for existing vessels. Certificates granted under the 1929 and 1948 conventions are no longer recognized by the Coast Guard. U.S. vessels with valid SOLAS 60 certificates may retain them until their normal expiration; all U.S. certificates issued after 25 May 1980 are consonant with SOLAS 74. The Coast Guard will continue to accept SOLAS 60 certificates on vessels of foreign countries which have not ratified SOLAS 74, or which issued such certificates prior to 25 May 1980.

30-9-1E. 1966 FIRE SAFETY STANDARDS FOR PASSENGER VESSELS

As a result of several disasters on board foreign passenger vessels in the early 1960's, 46 U.S.C. 362(c) was enacted. This law applies to "all foreign and domestic vessels of over 100 tons (G.T.) having berth or stateroom accommodations for 50 or more passengers, departing from a U.S. port, with passengers who are U.S. nationals who embarked at that port." The law provides that after 2 November 1968 such vessels shall not depart a U.S. port if they do not comply with the Fire Safety Standards embodied in Resolution A. 108 (ES III), adopted by the Intergovernmental Maritime Consultative Organization (IMCO) on 30 November 1966 as an amendment to SOLAS 60.

The requirements of the 1966 Fire Safety Standards applicable to U.S. vessels have been incorporated into Title 46, CFR. Those applicable to foreign vessels are indicated in Part C (Fire Protection Equipment) of Form CG-840F, Control Verification for Examination of Foreign Vessel.

30-9-1F. 1967 FIRE SAFETY STANDARDS

On 25 October 1967, IMCO adopted Resolution A. 122(V), which proposed alternate fire safety standards for newly constructed passenger vessels. The 1967 standards may be utilized in lieu of the standards specified in 46 U.S.C. 362(c), and are contained in Navigation and Vessel Inspection Circular (NVC) 1-75. Resolutions A. 108 ES(III) and A. 122(V) have been incorporated into part F, Chapter II-2 of SOLAS 74.

30-9-5. REFERENCES

30-9-5A. INTERNATIONAL CONVENTIONS AND CONFERENCES ON MARINE SAFETY, CG-242

This publication contains the text of the 1948 SOLAS Convention, including a summary of committee reports and background information on the conference, and the text of the 1960 SOLAS Convention. It is for official use use only, and is not available to the public. Each marine safety unit shall maintain a copy of CG-242 as required by the Directives, Publications, and Reports Index, COMDTNOTE 5600 (old CG-236).

30-9-5B. MARINE SAFETY MANUAL, COMDTINST M16000.3

Chapter 2 (Volume I) of this manual contains information on the SOLAS conventions and the authorities which place them into effect. Chapter 32 of the manual provides guidance on the inspection and control of foreign vessels under SOLAS 74.

30-9-5C. IMPLEMENTING REGULATIONS

SOLAS 74 requirements generally are incorporated into Title 46, CFR without specific mention of the convention. Among those regulations which do make specific mention of SOLAS 74 and its application are:

- All vessels - 46 CFR 2.01-25;
- Passenger vessels - 46 CFR 70.05-3(b)(1), 70.05-10, Table 70.05-1(a) footnote 6, and 71.75;

- Cargo and miscellaneous vessels - 46 CFR 90.05-1(a)(1), Table 90.05-1(a) footnote 6, 90.05-10, and 91.60;

- Tank vessels - 46 CFR 30.01-5(e)(1), Table 30.01-5(d) footnote 6, and 31.40;

- Small passenger vessels - 46 CFR 175.05-1, Table 175.051(a) footnote 6, 175.05-1(c), and 176.35;

- Oceanographic vessels - 46 CFR Table 188.05-1(a) footnote 6, 188.05-10, 188.10-35, and 189.60.

30-9-5D. PARTIES TO INTERNATIONAL CONVENTIONS

Plate 8-2-10.1 (Volume I of this manual) lists those countries which have ratified SOLAS 74 as well as other international conventions.

30-9-10. CERTIFICATES ISSUED UNDER SOLAS 74

30-9-10A. U.S.-FLAG VESSELS

All U.S.-flag vessels subject to SOLAS 74 which are found to comply with the applicable requirements of the convention shall be issued convention certificates, as appropriate. These are:

(1) Passenger Ship Safety Certificate (Form CGHQ-968), issued by Commandant (G-MVI);

(2) Cargo Ship Safety Equipment Certificate (Form CG-3347), issued by the OCMI to cargo, tank, and miscellaneous vessels;

(3) Cargo Ship Safety Construction Certificate (Form CG-4359), issued by either the OCMI or the American Bureau of Shipping (ABS) to cargo, tank, and miscellaneous vessels;

(4) Nuclear Passenger Ship Safety Certificate, issued by Commandant (G-MVI);

(5) Nuclear Cargo Ship Safety Certificate, issued to cargo, tank, and miscellaneous nuclear-powered vessels by Commandant (G-MVI);

(6) Safety Radiotelephony Certificate, issued by the FCC to cargo, tank, and miscellaneous vessels fitted with radiotelephone installations;

(7) Safety Radiotelegraphy Certificate, issued by the FCC to cargo, tank, and miscellaneous vessels equipped with radiotelegraph installations;

(8) Exemption Certificate (Form CGHQ-967), considered part of the convention certificate which it modifies. Commandant (G-MVI) will issue Exemption Certificates, through the cognizant OCMI's, only under the following conditions:

(a) For passenger vessels which qualify for a Passenger Ship Safety Certificate, to modify part V (Radiotelegraphic Installations) of the certificate upon request by the FCC;

(b) For cargo, tank, and miscellaneous vessels, to modify the Cargo Ship Safety Equipment Certificate.

(NOTE: Exemption Certificates to modify the Safety Radiotelephony or Radiotelegraphy Certificates of non-passenger vessels are issued by the FCC.)

30-9-10B. FOREIGN VESSELS

Convention Safety Equipment Certificates may be issued to foreign vessels in the same manner as for U.S. vessels, except that such certificates will be issued only upon request by a consular representative of the flag country. Every such certificate shall include a notation identifying the person requesting issuance of a certificate.

Issuance of Form CG-4504, Control Verification for Foreign Vessel, to foreign vessels having convention certificates is discussed in chapter 32 of this manual.

30-9-10C. AMENDMENTS TO CONVENTION CERTIFICATES

Although SOLAS 74 makes no provisions for amendment of a convention certificate, it is anticipated that a certificate may be corrected occasionally to reflect changes in items noted on the certificate. When a Certificate of Inspection (COI) is amended, the convention certificate should likewise be reviewed for accuracy. Any corrections necessary shall be made by withdrawing the old certificate and reissuing a corrected certificate with the same expiration date. In case of a Passenger Ship Safety Certificate, the corrected copy shall be requested from Commandant (G-MVI).

When changes are made to the equipment carried (e.g., replacement of a lifeboat), yet the vessel itself remains in compliance with the requirements of the convention, no amendment of the certificate is necessary.

30-9-15. APPLICATION FOR CONVENTION CERTIFICATES

30-9-15A. APPLICATION TO OCMI

The master, owner, or agent of a vessel for which a Passenger Ship Safety Certificate, Cargo Ship Safety Equipment/Construction Certificate, or Exemption Certificate is desired shall indicate on Form CG-3752, Application for Inspection of U.S. Vessel, the convention certificate(s) desired and state whether the Coast Guard or ABS will issue the Cargo Ship Safety Construction Certificate, if appropriate.

30-9-15B. APPLICATION TO FCC

The master, owner, or agent of a vessel for which a Safety Radiotelephony/Radiotelegraphy Certificate or Exemption Certificate is desired shall forward an application to the local office of the FCC.

30-9-15C. ACKNOWLEDGEMENT OF APPLICATIONS

30-9-15C(1). Passenger Vessels. The OCMI shall utilize Form CG-969, Notice of Receipt of Application for Safety Certificate. This document may be shown to explain the lack of a valid Passenger Ship Safety Certificate in the event the latter has not been received by the master prior to sailing.

30-9-15C(2). Cargo, Tank, and Miscellaneous Vessels. Form CG-969 shall not be used to acknowledge applications for Cargo Ship Safety Equipment Certificates. As these are issued by the OCMI, it is intended that such certificate be issued prior to sailing of the vessel.

30-9-20. COORDINATION OF CONVENTION INSPECTIONS WITH FCC

30-9-20A. PASSENGER VESSELS

The inspection of a passenger vessel for the issuance of a Passenger Ship Safety Certificate is conducted by both the Coast Guard and the FCC. The certificate is issued only after the Commandant has received reports of inspection from the OCMI and the FCC. Because it is desirable for the two agencies to issue concurrent certification, the FCC has agreed to coordinate radio equipment inspections (including those of portable lifeboat radio apparatus) with those conducted by the Coast Guard.

In order to facilitate this coordination, the OCMI shall, upon receipt of an application for inspection leading to the renewal of a COI or the issuance of a Passenger Ship Safety Certificate, notify the local FCC office of the following:

(a) The date on which it is anticipated that the Coast Guard inspection will be completed; or

(b) That the Coast Guard inspection will not be completed, and the vessel's COI not renewed prior to the vessel's sailing for a non-international voyage on the high seas.

If it is anticipated that Coast Guard inspection will be completed at that port, the FCC inspection will normally be carried out on the date indicated by the OCMI. However, when there is insufficient time between the completion date of the Coast Guard inspection and the vessel's sailing date, the FCC inspection will be made at least one business day before the sailing date. In the latter case, the FCC inspection will be made prior to sailing if the vessel's station license certification will expire before the return of the vessel to a U.S. port.

Upon completion of its inspection, the FCC will forward a copy of its Form 806, Certificate of Compliance with the Radio Provisions of the International Convention for the Safety of Life at Sea, or an FCC Letter of Exemption to the OCMI. The OCMI shall forward the FCC document to Commandant (G-MVI) along with Form CG-969A (Notification of Approval for Passenger Ship Safety Certificate) and a current copy of the vessel's COI.

An Exemption Certificate modifying that part of the Passenger Ship Safety Certificate covering radio equipment will be issued only upon receipt of a request from the FCC to issue an Exemption Certificate, when the vessel has applied for a Coast Guard inspection, and when it has met all the applicable requirements of the convention administered by the Coast Guard.

30-9-20B. CARGO, TANK, AND MISCELLANEOUS VESSELS

The FCC conducts annual inspections of radio equipment (including the portable lifeboat radio equipment) on board cargo, tank, and miscellaneous vessels subject to the requirements of SOLAS 74. These inspections are normally conducted at the time of the Coast Guard inspection for certification or mid-period reinspection.

30-9-25. ISSUANCE OF CONVENTION CERTIFICATES

30-9-25A. PASSENGER VESSELS

Upon satisfactory completion of a SOLAS inspection of a passenger vessel entitled to the privileges of the convention, the OCMI shall complete Form CG-969A, Notification of Approval for Passenger Ship Safety Certificate, for forwarding to Commandant (G-MVI). For those vessels requiring exemptions from SOLAS inspection requirements for which written application has been made by the master, owner, or agent, the OCMI shall list the recommended exemptions on the reverse side of Form CG-969A.

Prior to submission of Form CG-969A, the OCMI shall ascertain that the vessel has a valid Load Line Certificate. A copy of the Load Line Certificate, FCC Form 806, and a copy of the vessel's COI shall be forwarded to Commandant (G-MVI) with Form CG-969A.

30-9-25B. CARGO, TANK, AND MISCELLANEOUS VESSELS

Upon the satisfactory completion of a SOLAS inspection of a cargo, tank, or miscellaneous vessel entitled to the privileges of the convention, the OCMI shall issue the vessel a Cargo Ship Safety Equipment Certificate, and a Cargo Ship Safety Construction Certificate if requested. In all cases, the certificate(s) shall be on board prior to sailing on an international voyage. These certificates shall be dated to expire at the same time as the vessel's COI.

When exemptions to the provisions of SOLAS 74 are requested, the OCMI shall delay the issuance of the Cargo Ship Safety Equipment Certificate until the Commandant has issued an Exemption Certificate or until the vessel complies with the terms of the convention. Recommendations with respect to requested exemptions shall be forwarded to Commandant (G-MVI) in the same manner as that provided for passenger vessels.

30-9-30. EXTENSION OF CONVENTION CERTIFICATES BY CONSULAR OFFICERS

Regulation 14 of Chapter I, SOLAS 74 provides for the extension of convention certificates by a duly authorized officer of the issuing country if the ship is not in a port of the country of registry when its certificate expires. This extension is only for the purpose of permitting the ship to complete its voyage to the country in which it is registered or is to be inspected, and then only in cases where it appears proper and reasonable to do so. The procedure for such extension for a U.S.-flag vessel is described in the U.S. Department of State's Foreign Affairs Manual (Vol. 7, Special Consular Services) as follows:

"524.6-3. Extension or Reissue of Certificates. When an international certificate issued under the terms of the International Convention for the Safety of Life at Sea to a vessel of the United States expires before or at the time the vessel reaches a foreign port or will expire before the vessel reaches a port of the United States, it may be extended by the consular officer, or a new certificate may be issued by authorities of a foreign government which is a party to the convention, according to the preference of the master. The request must come from the master. A request or preference expressed by the agent of a United States vessel should not be honored unless the agent is acting at the master's specific request."

30-9-35. SPECIAL CONSIDERATIONS AND EQUIVALENTS

30-9-35A. GENERAL

Regulation 5 of Chapter I, SOLAS 74 provides for the substitution of equivalent fittings, appliances, apparatus, or arrangements when the "administration" (the government of the state whose flag the ship is entitled to fly) is satisfied that the substitute is as effective as that item specified in the convention.

It should be noted that, unless otherwise provided, chapters II-1, II-2, and III of SOLAS 74 apply to new vessels. Special provision is made for existing vessels and, generally, they are expected to meet the requirements for "Construction" and "Lifesaving Appliances, etc.," insofar as considered reasonable and practicable by the administration.

30-9-35B. DISPENSING WITH PORTABLE LIFEBOAT RADIO APPARATUS

Regulation 13(b) of Chapter III, SOLAS 74 permits portable lifeboat radio apparatus to be dispensed with on vessels engaged on voyages of such duration that the administration considers it unnecessary. Approval to dispense with this equipment is given by the FCC and so stated on the Radiotelephony/Radiotelegraphy Certificate.

30-9-35C. SUBMERSIBLE BILGE PUMPS ON PASSENGER VESSELS

Submersible bilge pumps are required by Regulation 18 of Chapter II-1, SOLAS 74 on new passenger vessels engaged on international voyages. Existing passenger vessels (ocean and coastwise) are not specifically required by Regulation 18 to have submersible bilge pumps. However, paragraph (a)(ii) of Regulation 1, Chapter II-1 states in part:

"As regards those requirements of Chapter II-1 of the present convention which are not contained in Chapter II of the 1948 Convention, the Administration shall decide which of these requirements shall be applied to existing vessels as defined in the present convention."

For existing passenger vessels (ocean and coastwise), this requirement will be satisfied if one of the required pumps is an emergency pump of a suitable submersible type.

30-9-35D. EQUIVALENTS FILED WITH IMCO

30-9-35D(1). Cargo Vessels of 500-1600 G.T. Except Tankers. Regulation 35 of Chapter III, SOLAS 74 provides that every cargo vessel, with certain exceptions, shall carry lifeboats on each side of the ship sufficient to accommodate all persons on board and, in addition, liferafts sufficient to accommodate half the number of all persons on board.

The U.S. Government has accepted an equivalent arrangement under the provisions of Regulation 5 of Chapter I, SOLAS 74. Cargo vessels of 500-1600 G.T., except tankers, may be equipped with:

(a) On each side of the vessel, one or more davit-launched inflatable liferafts of sufficient capacity to accommodate the total number of persons on board;

(b) A minimum of one launching device on each side of the vessel. Operation of the raft launching device shall not require anyone to remain on board;

(c) Sufficient float-free inflatable liferafts with capacity to accommodate not less than one-half of the total persons allowed on board;

(d) On a vessel on which persons on board need not board inflatable liferafts in the water nor descend to them a distance in excess of 3 meters, float-free inflatable liferafts on each side of the vessel of sufficient capacity to accommodate the total number of persons on board may be substituted for davit-launched rafts and launching equipment;

(e) A motor-propelled rescue boat suitable for ocean service with a davit or other suitable launching gear capable of launch by no more than three persons.

In accepting this equivalent arrangement, the U.S. has taken into account two separate sea trials and experience gained on vessels not subject to the provisions of SOLAS 74. The sea trials referred to were conducted with motor vessels subject to the convention that were designed as supply vessels for offshore drilling sites.

30-9-35D(2). Subchapter T Vessels on Routes Between Florida and The Bahamas. Regulation 5 of Chapter I, SOLAS 74 provides that administrations may allow other provisions to be accepted if satisfied that the alternate provisions are at least as effective as those required by present regulations.

The U.S. Government has accepted the provisions of Subchapter T as equivalent to the SOLAS provision for small passenger vessels to operate on the route between the east coast of Florida and the Bahamas, not more than 30 miles from land, provided that the vessel also:

(a) Is of less than 100 G.T.;

(b) Carries less than 50 passengers;

(c) Is certificated by the Coast Guard for a 100-mile ocean route;

(d) Is equipped with inflatable liferafts for all persons on board;

(e) Is equipped with a LORAN C set and a fathometer; and

(f) Is equipped with two fixed bilge pumps (which may be combination bilge/fire pumps).

In accepting these equivalent provisions, the U.S. has taken into account operations and proven reliability of vessels constructed under the provisions of Subchapter T, the sheltered nature of the route, and search and rescue capabilities in this area of operation.

30-9-40. SMALL PASSENGER VESSELS SUBJECT TO SOLAS 74

30-9-40A. VESSELS INSPECTED UNDER SUBCHAPTER T

30-9-40A(1). Drydocking. Vessels holding SOLAS certificates must have a drydock inspection at least once every 12 months.

30-9-40A(2). Lifeboatage. Chapter III of SOLAS 74 requires 100% lifeboatage, with the provision that the administration may permit exemptions according to the route and service. Small passenger vessels on international voyages requiring ocean or coastwise routes may be exempted from the requirement for lifeboats, provided they are equipped with inflatable liferafts sufficient for all persons carried. Vessels on lesser routes may utilize lifefloats or buoyant apparatus capable of accommodating all persons carried. In all cases, a suitable rescue boat shall be provided unless the OCMI deems this provision unnecessary.

30-9-40A(3). Number of Passengers. Except as noted below, vessels carrying 150 passengers or less which are found to comply with the requirements for a COI will, generally, be considered satisfactory for international voyages if routes are so limited as to permit exemption under Regulations 1(c) of Chapter II-1, 1(e) of Chapter II-2, and 3(a) of Chapter III, SOLAS 74.

Vessels carrying more than 150 passengers on international voyages shall comply with the provisions of Chapter II-2, SOLAS 74. Relative to the manning standards of Subchapter T, Chapter II-2 of SOLAS 74 assumes greater importance and, accordingly, no major exemptions should be granted which would reduce the overall safety afforded new vessels constructed under SOLAS.

Vessels having overnight accommodations for 50 or more passengers must, in the OCMI's judgment, reasonably comply with the structural fire protection requirements of SOLAS 74 before an exemption will be permitted. When evaluating exemption requests for such vessels, due consideration shall be given to vessel size, route, configuration, etc. However, it is emphasized that vessels with overnight accommodations for 50 or more passengers must be in reasonable compliance with the fire protection requirements.

30-9-40A(4). Certificates. Certificates of Inspection, Form CG-3753, shall be issued for one year for both TS and TL vessels to correspond with the Passenger Ship Safety Certificate. A Passenger Ship Safety Certificate and Exemption Certificate will be issued annually by Commandant (G-MVI) upon receipt of Form CG-969A (Notification of Approval for Passenger Ship Safety Certificate), a copy of FCC Form 806 or an FCC Exemption Certificate, and a current copy of the COI. Form CG-969A shall include the OCMI's recommendations for exemptions and a listing of the sections of Chapters II-1, II-2, III, and IV of SOLAS 74 requiring exemption. Vessels shall not be permitted to operate on international voyages without the required safety and exemption certificates. COI's should be revoked if necessary to obtain compliance (see section 30-9-25A).

Exemption Certificates will not be issued unless a Passenger Ship Safety Certificate is also issued. Thus, the Exemption Certificate requested by the FCC will not be issued until application has been made for a Passenger Ship Safety Certificate, and the vessel has been inspected by the Coast Guard and found to qualify for the safety certificate.

The routes specified on the COI, Passenger Ship Safety Certificate, and Exemption Certificate must agree. If the owner requests a route specification from the FCC which is different from one that is indicated on the COI, the safety and exemption certificates will be held by Commandant (G-MVI) until the matter is resolved.

MARINE SAFETY MANUAL

PART 30-10 -- INSPECTION PROCEDURES APPLICABLE TO VESSEL TYPES, CLASSES, AND CATEGORIES

30-10-1. INTRODUCTION

This part discusses inspection methods, procedures, decisions, and interpretations that particularly apply to a vessel of a particular type, class, or category. Some of this information refers to other parts of this manual.

30-10-5. PASSENGER VESSELS.

(To be developed.)

30-10-10. SMALL PASSENGER VESSELS

30-10-10A. GENERAL

The Commandant believes that the regulatory program for small passenger vessels requires a realistic appraisal of the operational necessities of the small passenger vessel industry. As with other regulations, because of the many types of vessels and operations to be considered, it has not been possible to develop regulations which cover all situations. Under 46 CFR 175-187 (Subchapter T - Small Passenger Vessels Under 100 Gross Tons), OCMI's are authorized, and will find it necessary, to accept alternates or equivalents and to grant departures from the regulations when special circumstances warrant such actions.

In the development of the regulations for small passenger vessels (or "T-boats"), the primary considerations were that:

(1) Most of the passengers carried are unacquainted with the hazards of the sea;

(2) Overloading, fires, explosions, and lack of seaworthiness have been the basic causes of some of the more serious casualties which have occurred on uninspected passenger-carrying vessels; and

(3) There is a need for a means of escape and survival in case of casualty to the vessel.

In carrying out the small passenger vessel inspection program, there can never be an assumption made that vessel owners or operators are familiar with Coast Guard regulations and procedures. Inspection personnel must continue to communicate with them on a personal basis to explain all requirements in detail. Experience has shown that after a vessel is inspected and the requirements are understood, most of the owner's apprehension subsides.

Reports of inspection for certification and reinspection of T-boats shall include lists of all items which have required interpretations of regulations and for which interpretations have been rendered by the OCMI, the district commander, or the Commandant. Such items would include equivalents, substitutions, non-approved equipment, non-standard fuel tanks, variations from subdivision standards, etc. These notes should preclude differing requirements, and form the basis for comparison with installed items, at subsequent inspections.

30-10-10B. STATUTES

The statutes that relate to the inspection and certification of small passenger vessels are 46 U.S.C. 362, 375, 390-390g, 391, 392, 399, 404, 416, 435, and 451 (see 46 CFR 175.01-1).

30-10-10C. INSPECTION OF SMALL PASSENGER VESSELS SUBJECT TO SUBCHAPTER T

30-10-10C(1). General. Passenger vessels, if less than 100 G.T. and not exempted from inspection by 46 CFR 175.05-1, shall be inspected and certificated under Subchapter T. Vessels carrying more than 150 passengers are subject to certain additional requirements as determined by the OCMI. Such additional requirements are contained in the applicable regulations in 46 CFR, Subchapters F, H, J, and P as outlined in 46 CFR 175.05-1(b).

30-10-10C(2). Vessels Carrying Freight for Hire. Cargo vessels 65 feet or less in length and over 15 G.T. inspected under 46 CFR 90-105 (Subchapter I - Cargo and Miscellaneous Vessels) may carry up to six persons in addition to the crew. However, any such vessel carrying more than six passengers shall be inspected under Subchapter T and issued a Certificate of Inspection (COI) as a passenger vessel on Form CG-3753, since 46 U.S.C. 882 has been modified by 46 U.S.C. 390.

Any T-boat may carry freight for hire subject to the conditions as may be imposed by the OCMI. These conditions shall include the following:

(a) That none of the cargo is prohibited on passenger vessels by 46 CFR 146-148 (Subchapter N - Dangerous Cargoes);

(b) That sufficient space is allowed for the number of passengers carried;

(c) That the vessel's stability is not endangered;

(d) That the vessel is not overloaded;

(e) That passenger emergency escapes and other emergency systems are not blocked; and

(f) That the passengers are notified of the presence on board of any dangerous articles or of any other conditions or circumstances which would constitute an element of risk for the passengers or crew.

30-10-10C(3). Vessels Subject To The Dangerous Cargo Act. All vessels inspected under Subchapter T are subject to the Dangerous Cargo Act, 46 U.S.C. 170, when carrying Class A explosives. All vessels which are 15 G.T. and over carrying passengers for hire are subject to 46 U.S.C. 170 when carrying Class B explosives and other dangerous articles or substances. Vessels in these categories shall be required to comply with the applicable regulations in Subchapter N.

30-10-10C(4). Foreign Vessels. Foreign vessels subject to Subchapter T shall be inspected and certificated in the same manner as U.S. vessels, except that a vessel of a foreign nation party to SOLAS 74 which has on board a current valid Passenger Ship Safety Certificate or Exemption Certificate shall be examined at least annually and, if found in compliance with requirements of the convention, shall be issued a Control Verification for Foreign Vessel (Form CG-4504).

A Canadian vessel which has on board a valid Canadian Certificate of Inspection shall be examined at least annually and, if found to comply with the terms of its COI, shall be issued a Control Verification for Foreign Vessel (Form CG-4504).

30-10-10C(5). Vessels Propelled By Sail. A sail vessel regulated under Subchapter T is a vessel which is propelled entirely by sail. A vessel with sails that also has means for propulsion by steam or by any form of mechanical or electrical power shall not be considered a sail vessel.

30-10-10C(6). Temporary Certificates Of Inspection. Form CG-854 shall be used as on other inspected vessels, except that it shall be carried in the same manner as the regular certificate and altered for use on T-boats by substituting "Section 390c" for "Section 399" in the first paragraph.

30-10-10C(7). Recognized Classification Societies. At the present time, the American Bureau of Shipping (ABS) and Lloyd's Register of Shipping are the only classification societies whose standards of construction and equipment have been accepted by the Commandant with respect to vessels inspected under Subchapter T.

30-10-10C(8). Life Ring Buoys. Previous specifications for life ring buoys in subparts 160.009 and 160.050 of 46 CFR, Subchapter Q (Specifications) required marking as follows: "For use on motorboats not carrying passengers for hire." These specifications have been changed to remove such markings as a requirement, and life ring buoys already manufactured shall not be prohibited on the basis of such markings on vessels inspected under Subchapter T.

30-10-10C(9). Spare Fuel For Outboard Motors. Under the authority of 46 CFR 147.03-1, certification has been given by the Commandant for the stowage of spare gasoline on decks of T-boats. This applies to vessels propelled by outboard motors as well as vessels carrying tenders, launches, etc., which are propelled by outboard motors. This certification is contingent upon compliance with the following conditions:

- The gasoline must be carried in 6 gallon-capacity steel containers, constructed so as to have a built-in ullage space;
- Such containers must be of at least 20-gauge, welded steel construction built to withstand an internal pressure of 25 psi;
- Containers shall comply with the ABYC H-25 standard for portable fuel systems and portable containers for flammable liquids;
- Containers must be stowed in a rack on deck in a manner to facilitate effective firefighting and in an area as far as possible from areas normally transited by passengers. Particular consideration must be given to ensure that stowage is away from ventilation intakes and sources of ignition. The stowage arrangement shall be to the satisfaction of the OCMI;
- Fire extinguishing devices and their locations shall be to the satisfaction of the OCMI;

- A maximum of 10 gasoline containers is allowed on board the vessel at any given time;

- "No Smoking" signs must be prominently displayed in the container stowage area;

- Empty containers must be handled and stowed with the same care as full containers;

- The vessel's COI must be specifically endorsed to reflect the stowage of gasoline containers on board the vessel.

Final authority to authorize this carriage of gasoline rests with the OCMI, and should be granted only after the vessel's owner documents a bona fide need for the extra fuel and meets all the control conditions.

30-10-10C(10). Application of SOLAS 74. See subpart 30-9-40 of this manual.

30-10-10C(11). Pollution Prevention. (To be developed.)

30-10-10D. CONTROL OF UNSEAWORTHY VESSELS

It is possible for a T-boat without a valid COI to be sold to a party who wishes to operate it for the carriage of more than six passengers without having it inspected and recertificated. This may be due to ignorance or an intentional disregard for the law. This could result in the operation of an unseaworthy vessel which, in addition to violating marine inspection laws, subjects the vessel to possible casualties and loss of life. Therefore, whenever seaworthiness is a question, upon voluntary surrender, revocation, or invalidation of a small passenger vessel's COI, the OCMI shall notify the owner in writing that:

(1) The vessel may not carry more than six passengers unless it is inspected and certified for passenger service;

(2) If the vessel is disposed of by sale, transfer, or any other means, the former owner is requested to inform the new owner of his obligation to obtain a valid COI before operating the vessel with more than six passengers;

(3) If the vessel is disposed of as mentioned above, the former owner is requested to notify the cognizant OCMI within 48 hours and furnish the name and address of the new owner;

(4) Continued operation or use of the vessel, for any purpose, in an unseaworthy condition may constitute negligent use under the Federal Boat Safety Act of 1971 and may subject the owner to civil or criminal penalties.

The required written notice may take the form of the sample letter found in plate 30-10-10D.1. A copy of the notification shall be placed in the vessel's file and, if the vessel is documented, a copy of the notification shall be forwarded to the vessel's port of documentation.

OCMI's shall also maintain a monitoring program for all T-boats within their zones which are determined to be unseaworthy. Coast Guard regular and Auxiliary units should be advised of the names of such vessels within their areas. This monitoring ensures the future operation of these vessels in compliance with applicable laws and regulations. To assist regular and Auxiliary personnel in this monitoring, T-boats are required to display a Certification Expiration Date Sticker in an easily visible location near each boarding area (see section 30-10-10I).

30-10-10E. CHARTERS FOR SMALL PLEASURE BOATS

The following discussion of charters of small pleasure boats is intended as a guide in determining whether a vessel under a purported bareboat charter is subject to inspection. OCMI's shall refer to the district commander all cases that cannot be clearly determined initially. Inspection of the vessel involved shall be deferred pending the district commander's determination.

During the formulation of plans to carry out the provisions of 46 U.S.C. 390, considerable discussion centered on the question of how the Coast Guard would apply inspection requirements to pleasure vessels (yachts) under circumstances where such yachts are chartered to others, ostensibly for pleasure purposes, under conditions whereby either the owner's yachtmaster or the owner in person accompanies the vessel while under charter. The fundamental question in such a case is whether or not the contract (charter-party) for the letting of the vessel is in fact a demise charter (or, as commonly called, a bareboat charter).

Under a demise or bareboat charter, the charterer takes over the vessel completely and may or may not man it with his own people. The charterer becomes what is known in law as the owner pro hac vice ("for this turn or occasion"), whether it be for a period of time or for a particular voyage.

No legalisms are necessary to create a demise of a vessel. It is sufficient that the language used in the charter-party shows an intent to transfer from the owner to the charterer the possession, command, and control of the vessel. While a certain clause in the charter-party may indicate the owner's intent to retain a certain amount of possession, command, and control, there may be other clauses clearly indicating a contrary intent. Hence, it is necessary to examine a charter-party as a whole to ascertain the true intent of the parties and the manner in which the contract is carried out by the parties. If the document construed as a whole shows a transfer of possession, command, and control to the charterer, and if the manner of carrying out the contract is consistent therewith, there is a true bareboat charter of the vessel.

It may be argued that a clause in a charter-party stipulating that the owner's master and/or crew will accompany the vessel is a failure to transfer sufficient possession, command, and control so as to create a true bareboat charter. While this may be correct under certain circumstances, such a clause does not necessarily mean that there is no bareboat charter of the vessel. It is emphasized that the intent of the contract as a whole plus the conduct of the parties is controlling. It is quite possible for there to be a bareboat charter so as to eliminate inspection requirements, even though the owner selects the master and/or crew to accompany the chartered vessel. On the other hand, the terms of a charter-party may, without qualification of any kind, show a clear intent to transfer complete possession, command, and control to the charterer, while the actual operation of the vessel is found to be contrary to such expressed intent. No bareboat charter would exist in this latter case.

The following elements have led to the conclusion that valid bareboat charters are in effect:

(1) A provision to the effect that, although the master and crew are furnished by the owner, full control, possession, and navigation is vested in the charterer (however, there is no harm in a provision requiring the charterer to be guided by the advice of the master in regard to technical navigating circumstances);

(2) A provision that the master and crew be paid by the charterer;

(3) A provision that all supplies, such as food, fuel, and stores be provided by the charterer;

(4) A provision that all port charges and pilotage fees be paid by the charterer;

(5) An insurance provision, at least to the extent of covering liability not covered by the owner's insurance. A greater indication of full control in the charterer would, of course, be shown if all insurance would be carried by the charterer (however, the owner should be able to protect his interest in the vessel);

(6) A provision granting the right to discharge for cause the master or any crewmember without reference to the owner;

(7) A provision for survey upon delivery and redelivery;

(8) A provision stipulating that the vessel may only be used for pleasure purposes of the charterer, his family, and guests, and that the vessel shall not engage in the transportation of merchandise or carry passengers for hire or engage in any trade in violation of the laws of the United States.

Any provision which tends to show retention of possession, command, and control (including navigation) by the owner should be carefully examined to see if it defeats a claimed intent to create a bareboat charter.

In those circumstances where the owner accompanies the vessel as master, the OCMI must study the charter closely. In such instances, it is very difficult for the owner/master to give up the amount of possession, control, and navigation necessary to create a true demise of a vessel.

Basically, neither the frequency of bareboat charter transportations nor the duration of the periods of time involved under the charter-parties has a bearing on whether or not a particular transaction is a demise. However, when it is known that a vessel is being chartered frequently, the nature of the transaction and the terms of the charter-party should be carefully examined in reaching a conclusion which will determine ultimately whether or not the vessel is subject to inspection.

(NOTE: Some owners employ the bareboat charter as a means of evading the inspection laws. Most of them do so under the assumption that their vessels could not qualify for a COI. In many cases, this assumption is unfounded. Vessel owners should be encouraged to communicate with the local marine safety unit to determine whether or not their vessels comply with the inspection laws and to learn what they may do to bring their vessels, if deficient, within compliance.)

30-10-10F. CABLE FERRIES

On 25 July 1922, the Acting Solicitor of the Department of Commerce rendered an opinion regarding a vessel operated as a double-ended ferry, with two drums on board for endless cable fastened on shore at each side of the river, the vessel thus being pulled across the river back and forth by machinery. This type of vessel was determined to be "propelled by machinery" and thus subject to inspection under 46 U.S.C. 404. Also, a ferry of less than 65 feet in length, propelled by machinery utilizing a cable attached to the vessel, is a motorboat within the meaning of the Motorboat Act of 1940 and is subject to the requirements thereof. It is immaterial whether the engine which actuates the drum for winding the cable is located on the vessel or on the shore.

30-10-10G. LENGTH DETERMINATION OF SMALL VESSELS

Several inquiries have been received by the Commandant as to the method of determining the length of small passenger vessels, particularly when length determines the specific regulations to be applied. It is not intended that a motor vessel be permitted to operate as a motorboat simply because its admeasurement length is recorded in Merchant Vessels of the United States (CG-408) at less than 65 feet. However, the determination of length, for obvious practical reasons, must be treated separately for inspected and uninspected vessels.

30-10-10G(1). Inspected Vessels. In the case of existing inspected vessels, the length as determined at the initial inspection should be accepted until such time as an alteration to the vessel would obviously necessitate remeasurement. In the case of new vessels that are being inspected for the first time, the length shall be determined in accordance with 46 CFR 175.10-19.

30-10-10G(2). Uninspected Vessels. The length as shown on the vessel's Federal or State documents should be accepted for the purpose of determining required equipment, etc., unless there is an obvious discrepancy.

30-10-10H. INSPECTIONS AND TESTS OF RAILINGS

A casualty aboard a certificated T-boat indicated that certain procedures on the part of Coast Guard inspection personnel may help prevent similar casualties. The vessel involved was a 95-foot party fishing boat with sixty-three persons aboard. While fishing offshore, in a moderate sea, the vessel rolled to starboard causing all the passengers on that side of the vessel to lean or fall heavily upon the railing at the same time. The railing gave way and nine persons fell overboard. Fortunately, all were recovered and no injuries were sustained.

Investigation revealed that the vessel had been inspected seven months prior to the casualty. Subsequently (not as a requirement of the inspection), the owner replaced the aluminum railing sockets. This was done without notification of or approval by the OCMI. The replacement sockets were not of a type acceptable for marine use, and when installed and painted their use was not readily discernible. The failure of these aluminum sockets was the primary cause of this casualty.

During the inspection of a T-boat, the inspector shall question the owner or his representative concerning any repairs which have been made or are anticipated. The requirement of the regulations that such repairs and/or alterations be made only with the knowledge and approval of the OCMI shall be explained and emphasized. Vessel railings shall be given a visual examination to identify any discernible defects or material problems. This shall be followed by an appropriate test to assess the ability of the railing to withstand the cumulative load of those persons who may be relying upon it for support. Prior to this casualty, moderate shaking of the railing had been regarded as acceptable testing, to relieve the owner from having to make what might be unnecessary repairs. The casualty demonstrated, however, that railings may periodically be required to withstand a cumulative and instantaneous lateral force from a large number of people. While a destructive test is not desired, the inspector shall test railings sufficiently to satisfy himself that a similar casualty would not be likely.

30-10-10I. PUBLIC AWARENESS

30-10-10I(1). General. It has been found that the public, in general, is unaware of the Coast Guard's safety requirements for small passenger vessels; the need for a public information program is considered necessary. A pamphlet entitled Safety for Small Passenger Vessels, CG-491, has been developed for this purpose. It is designed to alert the public to Coast Guard inspection and licensing requirements on T-boats. An initial bulk supply of these pamphlets has been distributed to marine safety and other field units in proportion to the number of T-boats operating in each zone. OCMI's shall provide these pamphlets to T-boat operators for further distribution to the public. The pamphlet is designed to permit vessel operators to stamp an individual vessel identification on the last page and thereby promote their own vessels.

Requests for additional pamphlets should be submitted on Form CG-4428 in accordance with the ordering instructions contained in the Directives, Publications and Reports Index, COMDTNOTE 5600.

30-10-10I(2). Certification Expiration Date Stickers. 46 CFR 176.01-45 requires small passenger vessels to display certification expiration date stickers as of 15 October 1978. This requirement is intended to increase public awareness of vessel inspection requirements and to encourage the public to favor T-boats which indicate that they meet those requirements (see plate 30-10-10I(2).1).

Stickers shall be made available by the inspector after completion of an inspection for certification, or at any time the inspector determines that additional stickers or different locations are needed to comply with the new regulation. Expired stickers and stickers on vessels whose COI's are surrendered or revoked must be removed.

The stickers are designed such that the expiration date of the COI can be punched into the date block at the bottom using a standard one-hole paper punch. OCMI's shall provide punches and scrapers to marine safety personnel as needed.

30-10-15. EXCURSION PERMITS

30-10-15A. GENERAL

An "excursion vessel," as referred to in 46 CFR 2.01-45, 72.40-5 (c), and 177.35-1(c), is a passenger vessel engaged in making short cruises for special events or recreational purposes. The operation of an excursion vessel is chiefly seasonal and normally involves the carriage of deck passengers.

30-10-15B. PERMITS

When such an operation is not permitted under the vessel's normal COI, a Permit to Carry Excursion Party, Form CG-949, may be issued under 46 CFR 71.10 or 176.01-30, as applicable. This would be the case when a passenger vessel is permitted to carry additional passengers or to operate on an extended route, or when a cargo or miscellaneous vessel is permitted to carry recreation parties on a one-day basis. The permit shall be issued for a limited time, and it shall be considered only a temporary supplement to the COI; an excursion permit shall not be used to circumvent inspection requirements. Instructions on the issuance of Form CG-949 are located in subpart 48-2-40 of this manual.

30-10-15C. CONDITIONS OF PERMITS

The OCMI shall be responsible for determining the additional number of passengers that may be carried, the number and kind of lifesaving appliances that shall be provided, and the limitations of route, etc., for a vessel to engage in an excursion as provided in 46 U.S.C. 453. Inspection of the vessel prior to issuance of a Permit to Carry Excursion Party shall be of the same scope as a reinspection of a passenger vessel, and particular attention shall be directed to lifesaving and firefighting appliances. The applicable minimum stability and fire safety standards shall be maintained in all cases and shall not be waived or relaxed.

30-10-15D. PASSENGER CAPACITY

The number of passengers normally permitted on excursion vessels shall be governed by 46 CFR 176.01-25. Vessels that do not comply with structural fire protection requirements of 46 CFR 177.10-5 shall not be allowed to carry more than 150 passengers. For those excursion vessels inspected under 46 CFR, Subchapter H (Passenger Vessels), there are no specific limitations in the regulations on the number of passengers permitted (other than stability limitations). In order to obtain some degree of uniformity in the application of the regulations, however, the criteria of one passenger for every 10 square feet of deck space shall be used as a guide by the OCMI's in determining the number of passengers permitted.

30-10-15E. OPERATIONAL LIMITS

The number of passengers and the route permitted for a vessel engaging on a temporary excursion under Form CG-949 shall be limited to an operation which the OCMI believes can be undertaken with safety. Careful consideration of possible downflooding (interior flooding of a vessel from the decks or over the gunwale) shall be given to river- and bay-type vessels in permitting an excursion route different from that which appears on the COI. Stability of the vessel shall always be considered in the issuance of a Permit to Carry Excursion Party.

30-10-20. CARGO VESSELS

30-10-20A. CARRIAGE OF PASSENGERS

Section 26 of the Merchant Marine Act of 1920, 46 U.S.C. 882 (relating to the carriage of passengers on other than passenger vessels in full compliance with the law and regulations), provides that the owner, agent, or master of the vessel shall notify the passengers of the presence on board of any dangerous articles or of any other condition or circumstance which would constitute a risk of safety for the passengers or crew prior to sailing. Accordingly, all persons other than members of the crew and military personnel carried (either under waiver or otherwise) on vessels not in full compliance with statutes and regulations applicable to passenger vessels must be given the notice as mentioned above. Failure to give such notice renders the vessel subject to a penalty of $500, which may be mitigated or remitted by the Commandant upon proper presentation of the facts or extenuating circumstances.

30-10-20B. PERSONS IN ADDITION TO THE CREW

A cargo or tank vessel shall comply with the laws and regulations relative to lifeboats, life preservers, and other lifesaving equipment before the vessel may carry persons in addition to the crew. After the vessel is found to comply with applicable laws and regulations, authority to carry up to sixteen persons in addition to the crew on domestic voyages, and up to twelve persons in addition to the crew on foreign voyages may be granted by issuing a Certificate of Inspection Amendment (Form CG-858) or by a special endorsement on the COI. The provisions of 46 U.S.C. 882 regarding carriage of persons (passengers) in addition to the crew, do not apply to motorboats (65 feet or less) which are inspected and certificated as freight vessels, passenger vessels, or passenger/freight vessels (see paragraph 30-10-10C(2)).

30-10-20C. CARRYING MORE THAN 16 PERSONS IN EMERGENCY SITUATIONS

P.L. 94-85, enacted on 9 August 1975, amends 46 U.S.C. 882 to allow cargo vessels to carry in excess of sixteen persons in addition to the crew in emergency situations. Certain conditions must be met before the OCMI can so amend the COI:

- The vessel must not be engaged in an international voyage;
- An emergency situation must exist;
- Additional lifesaving and firefighting equipment found necessary by the OCMI must be provided;
- A stability evaluation must have been performed; and
- Any other conditions considered necessary by the OCMI must be satisfied (see 46 CFR 91.01-25).

30-10-20D. SUBDIVISION

The 1966 Load Line Convention allows deeper drafts for those dry cargo vessels which qualify as one- or two-compartment subdivision vessels. The determination and assignment of a load line is a function delegated to ABS. Therefore, when a deeper draft is allowed due to subdivision consideration, it is necessary that inspections for certification and subsequent reinspections be conducted with the object of proper maintenance of bulkheads, closures, etc., essential to the preservation of the applicable subdivision criteria (see Chapter 76 of this manual).

30-10-20E. EQUIVALENTS FILED WITH IMCO

See section 30-9-35D of this manual.

30-10-20F. POLLUTION PREVENTION

(To be developed.)

30-10-20G. CARRIAGE OF COMBUSTIBLE LIQUIDS IN BULK ABOARD CARGO VESSELS

Vessels certificated as passenger, cargo, or miscellaneous vessels may carry limited quantities of flammable or combustible liquid cargo in bulk in accordance with 46 CFR 30.10-5, 70.05-30, and 90.05-35. However, the principal purpose or use of such vessels may not be the carriage of such cargo. "Limited quantities" shall not exceed 20 percent of the vessel's deadweight, and shall apply only to bulk liquid cargo or that cargo carried in integral or independent tanks. There is no limit to the total quantity carried in portable tanks or marine portable tanks. "Principal purpose" as used herein cannot be further defined. A subjective evaluation will have to be made on a case-by-case basis by the OCMI to determine that the vessel will not primarily engage in the carriage of liquid bulk cargo.

Cargo barges certificated under Subchapter I may not carry flammable or combustible bulk liquid cargoes in any quantity. Barges carrying such cargoes are considered tank barges and shall be certificated under Subchapter D. Subchapter I barges may, however, carry fuel for the use of their machinery and not be considered tank barges. Where it is demonstrated that there is a need for additional fuel on occasional long voyages, a Subchapter I barge may carry such fuel for its propelling vessel. This may be permitted only when the OCMI is satisfied there is a genuine need for the fuel and that the applicable admeasurement or safety regulations are not being circumvented. This concept should be applied only for occasional long voyages; if the additional fuel is needed on a regular route, a propelling vessel with its own sufficient fuel capacity should be employed.

The cargo oil discharge containment requirements of 33 CFR 155.310 shall be applied to Subchapter I vessels where 250 barrels or more of bulk cargo oil are carried. However, the pollution requirements of 33 CFR 157 are not applicable to vessels certificated solely under Subchapter I.

30-10-25. TANK VESSELS

30-10-25A. PERMANENTLY MOORED TANK VESSELS

A tank vessel that is permanently moored at a fixed location to dispense, receive, or store flammable or combustible liquids in bulk may, at the request of the owner, be considered "substantially a land structure" and subjected to the waterfront facility regulations (33 CFR 126, 154, and 156). To qualify under this terminology, the vessel must be securely and substantially moored by means such as cables, chains, structural steels, etc. to a solid onshore anchorage or other captive structure. These mooring arrangements must be approved by the cognizant OCMI and must be capable of withstanding all wind, ice, and water conditions normally encountered at the location (see section 30-10-50A for discussion of permanently moored structures).

It is incumbent upon the owner, his representative, or the operator to notify the cognizant OCMI before any changes are made in the mooring arrangement or location of the structure. The structure may be temporarily placed in navigation (becoming a vessel again) only with the advice and approval of the OCMI, who may issue such requirements as are necessary to ensure the safety of the vessel and U.S. waters. The authorization to place the vessel in navigation may be issued by letter, a COI of limited duration, or a permit to proceed as appropriate. When the vessel is remoored, the OCMI must re-evaluate the new mooring arrangement before the vessel may again be considered "substantially a land structure."

If a unit is documented as a vessel of the United States, it may not be considered "substantially a land structure" under this policy.

30-10-25B. TANKSHIPS CARRYING GRAIN CARGO

No amendment to the COI is necessary for a tankship to carry grain cargo. A study of the modifications considered necessary in order to carry grain in bulk in the cargo tanks indicates that, ordinarily, none of the essential features of a tankship are lost. Usually, sounding pipes are fitted to each tank; the cargo stripping suctions are fitted with burlap-covered rose boxes and made to serve as bilge suctions; a non-return valve is installed at the stripping pump suction; the main cargo suctions are blanked off and cement-sealed burlap is installed at each bell mouth; the main cargo header in the pump room is blanked off; and, all cargo valves are closed and locked. To return such vessel to full tanker status requires removal of blanks from the main cargo suctions and manifolds, the removal of burlap and cement seals in the cargo tanks after discharge of the grain cargo, and the cleaning out of its remnants. After inspection of a tank vessel which has been modified to carry grain in bulk, the OCMI shall determine if the essential features which make the vessel eligible to carry flammable or combustible liquid cargo in bulk have been removed; if not, no amendment to the COI need be made unless requested by the owners.

30-10-25C. TANK BARGES NOT CARRYING FLAMMABLE OR COMBUSTIBLE LIQUIDS

Barges which have been certificated to transport flammable or combustible liquids of Grades D and E may retain their unexpired COI on board when transporting cargoes that are not considered flammable or combustible liquids. The owners of certificated tank barges should be advised that, in order to retain the COI, a barge must at all times comply with the regulations for tank vessels. Any changes made in the vessel's equipment or construction that are expressly required by the regulations would automatically make the COI subject to withdrawal.

30-10-25D. METAL HOODS AND HOUSINGS

46 CFR 32.35-5 requires a metal hood or housing over pump engines on tank barges to provide protection for the pump engine against weather and damage during cargo or hose handling. Where an installation is such that the use of a metal hood or housing over the pump engine is not necessary for the purpose of providing the desired protection, such installation may be accepted provided the arrangement affords equivalent protection. Each tankship and tank barge should be evaluated on its relative merits, as should the design installation of the pump engines, for the purpose of determining the need for protection to be obtained by the installation of a metal hood or housing or by the use of an acceptable equivalent means of protection.

30-10-25E. REFINERY WASTE AND DIRTY BALLAST

Barges used for the transportation of refinery waste, residual cargo, or dirty ballast from tank-cleaning operations are subject to inspection and certification when they have on board flammable or combustible liquids in bulk. The application of 46 U.S.C. 391a to vessels other than public vessels is not contingent on the vessel's use in trade or commercial service, so long as the liquid is in bulk as cargo or in residue. When such barges are used to handle flammable or combustible liquids, even if diluted with water, fire and explosion hazards are nonetheless present and the applicable safeguards contained in Subchapter D must be complied with.

30-10-25F. LOCATION OF FLAME ARRESTERS

The regulations at 46 CFR 32.55-20(b)(4) state in part that "The vent header shall be fitted with a flame arrester or pressure vacuum relief valve." This regulation applies to the venting of cargo tanks transporting Grade A liquid on tankships constructed on or after 1 July 1951. This regulation does not require either the flame arrester or the pressure-vacuum relief valve to be installed at the outlet. Some vessels have installed a pressure-vacuum relief valve in the horizontal deck header rather than a pressure-vacuum relief valve or flame arrester at or near the outlet. The Commandant has accepted this arrangement. The requirement for a flame arrester or a pressure-vacuum relief valve in the header is in addition to the pressure-vacuum relief valve in the individual branch vent line. On the other hand, pressure-vacuum relief valves in the branch vent lines are not mandatory (see 46 CFR 32.55-20(b)(3)).

30-10-25G. CARRIAGE OF PASSENGERS

(See sections 30-10-20A and B.)

30-10-25H. PRESSURE VESSEL TYPE CARGO TANKS

Review of Headquarters records of tank barges certificated to carry liquefied gas in pressure vessel-type cargo tanks indicate that the tanks on several such barges over 20 years old have never been hydrostatically tested. In accordance with 46 CFR 38.25-1(b), a hydrostatic test of such tanks may be conducted at any time that an inspector considers such a test necessary to determine the condition of a tank. When a tank barge which is 20 or more years old becomes due for an internal exam, the cargo tanks should be very carefully examined and the desirability of a hydrostatic test especially considered.

30-10-30. SEAGOING BARGES

30-10-30A. REQUIRED INSPECTIONS

Sections 10, 11, and 12 of the Act of May 28, 1908, as amended (46 U.S.C. 395-397), require inspections of the hull and equipment of every seagoing barge of 100 G.T. or more (seagoing barges are defined in 46 U.S.C. 395(a)).

Scows and other similar types of vessels are seagoing barges within the meaning of 46 U.S.C. 395 and therefore require a COI when operating on the high seas. When a COI is issued to a seagoing barge, the barge is subject to the inspection requirements until the COI is surrendered or expires, even though the barge may be operated for part of the time in inland water areas (see part 76-1 (Volume V) of this manual for load line requirements).

An amendment to 46 CFR 7 (Boundary Lines) will be made to specifically refer to 46 U.S.C. 395. Until such time, seagoing barges shall be inspected when, in the judgment of the OCMI, the route assigned to such barges carries them into waters which are essentially outside sheltered waters and exposes them to the effects of open seas. For the purposes of inspecting seagoing barges, sheltered waters may not be located more than 12 nautical miles seaward of the base line from which the territorial sea is measured.

30-10-30B. SEAGOING WOODEN BARGES

Particular attention should be given to the inspection of seagoing wooden vessels of considerable age. If the vessel is not on drydock at the time of inspection, a thorough examination of the entire structure shall be made, insofar as possible. In this connection, the ceiling may be lifted for examination of the framing at such places as the marine inspector may deem necessary. Should doubt as to the soundness of the structure remain, the vessel should be placed in drydock for further examination. The following checklist is offered for guidance at drydock examinations of wooden vessels:

(1) The keel, stem, stern frame and sternposts, decks, hatch coamings, and the means of closing hatches should be examined;

(2) The outside planking should be clean so that a thorough examination can be made, and the entire outside planking shall be examined and caulked where necessary;

(3) Careful examination should be made of all fastenings, especially in the centerline members. Where there is evidence of fastenings having been strained, new fastenings should be driven through and clinched;

(4) Beams, beam ends, beam end connections, and knees should be examined and bored to determine their condition. If the condition of the beam end connections is uncertain, sufficient deck planking should be removed in the way of beam ends for inspection;

(5) Borings should be made to determine the condition of the planking and framing, and should such boring cause doubt as to the condition of the framing, a number of outside planks above and below the bilge strakes should be removed for a thorough examination of the frame timbers;

(6) Limbers should be clear;

(7) Special attention should be paid to the condition and efficiency of bilge pumping arrangements.

30-10-30C. SEAGOING DUMP SCOWS

30-10-30C(1). General. All non-self-propelled vessels of 100 G.T. and more that do in fact navigate on the high seas are subject to inspection and certification, whether or not they are designed for service on the high seas and whether or not another port is visited.

30-10-30C(2). Plan Approval. Complete plan approval is required for all vessels contracted for on and after 1 January 1964, and all applicable plans shall be submitted as required by 46 CFR, Subchapter I.

30-10-30C(3). Inspections. The basic regulations for inspecting these vessels are in Subchapter I. It is the Commandant's policy that the OCMI liberally construe the intent of the regulations, while seeking to ensure that the vessel can be navigated with safety. Any unusual condition or feature of the vessel which is found to be acceptable by the OCMI at the initial or subsequent inspections shall be made a matter of record, so that once having been accepted it will not be rejected at a later date.

30-10-30C(4). Load Lines. See part 76-1 (Volume V) of this manual for load line requirements. If a load line assignment is not required, draft limitations may be imposed as a prerequisite to obtaining a COI if, in the opinion of the OCMI, limitations are necessary for the safety of life and property.

30-10-30C(5). Lifesaving Equipment. When such vessels are operated as manned barges, whether manning is required or permitted, the requirements of 46 CFR 94 (Lifesaving Equipment) apply. The regulations permitting substitution of inflatable liferafts may be utilized. However, barges that do not sail more than 20 miles from a harbor of refuge and which return to that harbor may be equipped with lifefloats or buoyant apparatus, in lieu of lifeboats or inflatable liferafts.

30-10-30C(6). Manning.

(a) Required Manning. Certain barges may be unmanned if so authorized by the OCMI. However, if a crew is required by the OCMI:

(i) 75% of the crew must be citizens of the U.S.;

(ii) 65% of the deck department, exclusive of licensed personnel, must be able seamen as defined in 46 U.S.C. 672b-11;

(iii) All crewmembers must possess a Merchant Mariner's Document; and

(iv) The watch system applies.

(b) Permitted Manning. When the OCMI does not deem it necessary to require a crew on subject barges, a crew may still be permitted and in such cases:

(i) Barges may carry a person or persons as maintenance men with no duties connected with the navigation of the vessel. A sample endorsement that may be used on the COI is:

> "Certificated without a navigating crew. The vessel may carry one person as maintenance man and operator of the dumping mechanism, with no duties connected with the navigation of the vessel."

(ii) 75% of the personnel of this "permitted" crew must be U.S. citizens; and

(iii) All crewmembers must be in possession of a Merchant Mariner's Document.

30-10-30D. NON-SELF-PROPELLED HARBOR DREDGES, BARGES, ETC., WHICH CHANGE PLACES OF EMPLOYMENT

30-10-30D(1). General. Non-self-propelled harbor dredges, barges, etc., of 100 G.T. or more, on voyages on the high seas when changing places of employment, are subject to inspection and certification when so operating. 46 CFR 91.01-10(c) provides for a limited or short-term certificate for such voyages. The intent of these regulations is to permit such voyages with barges either manned or unmanned. In those cases where barges are manned, the intent is to require a more thorough inspection than if they were operated unmanned.

30-10-30D(2). Plan Approval. Plan approval is not a prerequisite to the certification of such vessels.

30-10-30D(3). Inspections. The basic regulations for inspection of such vessels are in Subchapter I. It is the Commandant's policy that, in applying the regulations, the OCMI liberally construe their intent, bearing in mind the overall responsibility to assure that the vessel can be navigated with safety.

30-10-30D(4). Load Lines. See part 76-1 of this manual for load line requirements. In the case of such vessels on high seas voyages which are not required to have a load line, the OCMI shall ensure that there are adequate closures to maintain watertight integrity for the duration of the voyage. Draft limitations may be imposed as a prerequisite to obtaining a COI if, in the opinion of the OCMI, they are necessary in the interest of safety of life and property. Non-self-propelled dredges may carry spare parts for their own machinery without having them considered as cargo if, in the OCMI's judgment, the quantity and weight of such spare parts are reasonable.

30-10-30D(5). Lifesaving Equipment. When vessels are operated as manned barges, whether manning is required or permitted, the requirements of 46 CFR 94 apply. Substitution of inflatable liferafts may be permitted.

30-10-30D(6). Boilers. In some cases, such vessels will be equipped with boilers. In those cases where the boilers will be used during the voyage, they shall be given such operating tests and examinations as the OCMI deems necessary to ensure proper functioning throughout the voyage. When these boilers will not be utilized during any part of the voyage on the high seas for change of place of employment, they will not be inspected. In any case, unsafe or unsatisfactory conditions shall be made a matter of record and the owner of the vessel so advised in writing by the OCMI.

30-10-30D(7). Wiring. Only the electric wiring that will be energized during any part of a voyage on the high seas for change of place of employment shall be subject to inspection. Any unsafe or unsatisfactory condition observed during the course of inspection shall be made a matter of record and the owner of the vessel so advised in writing by the OCMI.

30-10-30D(8). Drydocking.

(a) Foreign Voyage. A drydock examination of the underwater body and outboard fittings of such vessels is a prerequisite to the issuance of a COI, unless there is a record of a satisfactory drydock examination within the preceding 18 months;

(b) Domestic Voyage. The OCMI shall normally require a drydock examination unless there is acceptable evidence presented of a drydocking and satisfactory condition reported within the past three years.

30-10-30D(9). Manning.

(a) Required Manning. Subject vessels may be towed unmanned if so authorized by the OCMI. However, if a crew is required by the OCMI:

(i) 75% of the crew must be citizens of the U.S.;

(ii) 65% of the deck department, exclusive of licensed personnel, must be able seamen;

(iii) All crewmembers must possess a Merchant Mariner's Document; and

(iv) The watch system applies (on voyages up to 600 miles only a 2-watch system is necessary).

(b) Permitted Manning. When the OCMI does not deem it necessary to require a crew on subject vessels, a crew may still be permitted and in such cases:

(i) Subject vessels may carry a person or persons as maintenance men with no duties connected with the navigation of the vessel. A sample endorsement that may be used on the COI by the OCMI might be:

> "Certificated without a navigating crew. The vessel may carry persons as maintenance men with no duties connected with the duties of the navigation of the vessel."

(ii) 75% of the personnel of this "permitted" crew must be U.S. citizens; and

(iii) All crew members must possess a Merchant Mariner's Document.

30-10-30E. BARGES ON SHELTERED WATERS OF BRITISH COLUMBIA

Barges of 100 G.T. and more making voyages on sheltered waters of British Columbia, as defined in a U.S.-Canadian treaty which entered into force on 26 July 1934 thus:

"The waters of Puget Sound, the waters lying between Vancouver Island and the mainland, and east of a line from a point one nautical mile west of the city limits of Port Angeles in the State of Washington to Race Rocks on Vancouver Island, and of a line from Hope Island, British Columbia, to Cape Calvert, Calvert Island, British Columbia, the waters east of a line from Cape

Calvert to Duke Point on Duke Island, and the waters north of Duke Island and east of Prince of Wales Island, Baranof Island and Chicagof Island, the waters of Peril, Neva and Olga Straits to Sitka, and the waters east of a line from Port Althorp on Chicagof Island to Cape Spencer, Alaska..."

should not be inspected as seagoing barges under 46 U.S.C. 395.

30-10-30F. TOWING OF VESSELS TO BE SCRAPPED

See section 30-6-10J of this manual.

30-10-30G. SHIP HULLS USED AS SEAGOING CARGO BARGES

Ship hulls under U.S. flag which are intended for use as seagoing barges, for delivery of cargo and scrap to foreign countries, are subject to the following minimum requirements:

(1) The vessel must comply with the regulations governing cargo stowage and securing arrangements. Approval by the National Cargo Bureau of these arrangements may be accepted as prima facie evidence of compliance;

(2) A load line is required;

(3) A minimal inspection is required; this may include a drydock examination if necessary, followed by certification as a seagoing barge;

(4) Should the vessel be manned by a riding crew, the following manning and equipment requirements are applicable:

(a) The vessel shall be manned by a crew of one master and six or seven seamen;

(b) Sufficient primary lifesaving equipment to carry all persons on board is required; a lifeboat (carried in such a manner that it could be readily launched) or a liferaft is acceptable;

(c) Means for pumping bilges and freeing the vessel of normal amounts of bilge water shall be provided;

(d) Provision should be made to supply electric power when applicable to loads covered by 46 CFR 112.15;

(e) Sufficient firefighting equipment should be provided to cope with any fire emergency which may be anticipated during the voyage.

For operations under a foreign flag, the vessel must be in possession of a valid Load Line Certificate. Requirements other than this would be imposed by the foreign country, underwriters, etc., not by the Coast Guard.

30-10-35. MOBILE OFFSHORE DRILLING UNITS (MODU'S)

Certificates of Inspection shall be issued for those MODU's found to comply with standards for crew safety and health. Issuance of an original COI should not be delayed for completion of drydocking or special examinations, issuance of an approved operations manual or stability letter, or load line assessment unless technical review, inspection, or review of operating problems indicate serious safety problems which warrant removing a MODU from service to resolve the unsatisfactory conditions (see NVC 4-78 and 46 CFR 107.211).

30-10-40. DRILL TENDERS

30-10-40A. GENERAL

Artificial islands erected on the Outer Continental Shelf in the Gulf of Mexico for the purpose of developing mineral resources may be regarded as places in the United States for the purpose of administering the navigation and vessel inspection laws. Accordingly, a drilling tender which is moored to one of these artificial islands and which provides support for the drilling operation may be considered to be in a port or place in the U.S.

30-10-40B. INSPECTIONS

30-10-40B(1). Special Agreements. Certain inspection agreements have been made with respect to vessels used as drilling tenders. These vessels are those engaged exclusively in the business of providing power, machinery, and accommodations for material and personnel used in operations for underwater drilling, mining, and related production purposes. They are normally anchored and not used for transportation. They operate for several months at a time at one location and normally move only for the purpose of proceeding to a new drilling site or a shipyard. Some of these vessels are self-propelled and others are not. All are inspected and certificated under Subchapter I.

30-10-40B(2). Drydocking. In accordance with subpart 30-8-1 of this manual, the period between drydocking required by 46 CFR 91.40 for full-scantling vessels may be extended. The extension should be granted by letter from the OCMI to the owner and should specify the date on which the extension expires and the conditions, if any, under which the request is granted. A copy of the letter should be retained on the vessel with the COI. Requests received by OCMI's who did not conduct the last inspection for certification on the vessel should not be granted until cleared with the OCMI who issued the vessel's certificate. Appropriate inspection of the vessel may be indicated when requests are received at times other than inspection for certification or reinspection. The date of the last drydocking should continue to be shown on the vessel's certificate with an asterisk and a notation concerning extension. Underscantling vessels such as LST's should not be granted extensions.

30-10-40B(3). Examinations of Tail Shafts and Stern Tube Bearings. Due to a very limited amount of time underway, drilling tenders need not be required to draw the tail shaft for examination until such time as the weardown exceeds the maximum permitted by 46 CFR 61.20-15. This should be handled on an individual vessel basis and upon written request. The extension should be granted in writing similar to a letter concerning drydocking. The date last drawn should continue to be shown on the vessel's certificate with an asterisk and a notation on extensions.

30-10-40B(4). Lifeboat Equipment. The lifeboats of self-propelled drilling tenders may be equipped in accordance with the requirements of 46 CFR 94.20-10 for lifeboats on a seagoing barge. In addition, each lifeboat shall be provided with a first aid kit and 12 red hand-held flare distress signals. Written requests by individual vessels, written authorizations by the OCMI, and appropriate notations on the certificate upon re-issue are required.

The relaxed conditions discussed above do not restrict or otherwise affect the prerogative of an OCMI to require drydocking, etc., for cause. Copies of all letter requests and letters of authorization shall be sent to Commandant (G-MVI) and the OCMI who issued the last COI.

30-10-40C. DELIVERY OF EXCESS FUEL TO OIL DRILLING PLATFORMS

The Tank Vessel Act, 46 U.S.C. 391a, permits certain offshore supply vessels to transfer fuel from their own fuel tanks to offshore drilling or production facilities, yet avoid inspection and certification as a tank vessel. A proviso in the act exempts "vessels of not more than 500 gross tons, documented in the service of oil exploitation, which are not tankers and which would be subject to this section only because of the transfer of fuel from the vessels' own fuel supply tanks to offshore drilling or production facilities." This proviso was intended primarily for uninspected vessels, since vessels which are inspected and certificated under Subchapter I are permitted by 46 CFR 90.05-35 to carry limited quantities of certain grades of flammable and combustible cargoes which do not have to be the same as the vessel's fuel. A second requirement for exemption is that the person-incharge of transfer operations must be a certified tankerman.

Another statute which allows vessels to dispense their fuel is 46 U.S.C. 467. This statute is much more restrictive in that the fuel must have a flash point of not less than 150°F, must be carried in double-bottom fuel tanks, must be the vessel's excess fuel, and cannot be discharged with passengers on board.

30-10-45. OCEANOGRAPHIC RESEARCH VESSELS

30-10-45A. GENERAL

Oceanographic research vessels (ORV's) shall be given an inspection for certification with such reinspections as are deemed necessary by the Commandant, in accordance with the provisions of 46 CFR 188-196 (Subchapter U - Oceanographic Vessels). Classification as an ORV requires a determination by the Coast Guard. In arriving at such a determination, an analysis of the particulars of service, method of operation, and classes of persons carried should be conducted. For those uninspected vessels which purport to be less than 300 G.T., admeasurement may be included in the analysis.

30-10-45B. ACCOMMODATIONS

Accommodations for officers, crew, and scientific personnel shall comply with 46 CFR 190.20, except that deck and engine groups of the crew on watch at the same time may be quartered together. In addition, special consideration shall be given to accommodations for scientific personnel carried on voyages of 14 days or less, provided the general intent of 46 CFR 190.20-5 is met. A space intended as a hospital space under the requirements of 46 CFR 190.20-35(a) may be used for ordinary berthing on voyages of three days or less.

30-10-45C. SCIENTIFIC PERSONNEL

Scientific personnel are not classified as either "seamen" or as "members of the crew", but are "other persons" engaged on board the ORV for the purpose of conducting the business of the vessel. The carriage of these scientific personnel shall be indicated by separate endorsement on the COI and reflected in the "total persons allowed."

30-10-45D. EMPLOYMENT

Uninspected vessels of less than 300 G.T. which are intended to be operated as oceanographic research vessels may receive a Letter of Designation as an ORV under 46 U.S.C. 441-445, in order to be exempt from certain vessel inspection requirements. Such a letter should be issued only if a vessel is determined to be operating "exclusively" in oceanographic research or in the instruction of oceanographic research or limnology. Information useful in determining whether or not a vessel should be so designated should be forwarded to Commandant (G-MVI) along with the OCMI's recommendation. After determination by the Commandant, a letter of designation is issued to the vessel by the OCMI. This letter not only designates the vessel as an ORV, but also advises the owner/operator that the vessel must maintain exclusive employment in oceanographic research or instruction, and that any deviation from such exclusive use may constitute violations of law and subject the vessel to inspection requirements. A copy of the letter of designation shall be forwarded to Commandant (G-MVI).

New regulations are being developed to require a letter of designation for all vessels under 300 G.T. which have been determined to be operating as oceanographic research vessels under 46 U.S.C. 441. Such a letter, issued by the OCMI upon approval by the Commandant, would designate the vessel as an ORV for a period of two years provided that operating conditions do not change.

30-10-45E. PUBLIC VESSELS

Public (e.g., U.S. Navy, NOAA) vessels operated for oceanographic research are not required to be inspected and certificated by the Coast Guard. However, such vessels may be inspected and certificated upon request by the parent agency and upon an inter-agency agreement to this effect. When public vessels are alternatively furnished a letter indicating a degree of compliance with the regulations, every effort should be made to obtain one-compartment subdivision and damage stability calculations when only 100% lifeboatage is provided.

30-10-50. VESSELS IN IMMOBILE STATUS

30-10-50A. PERMANENTLY MOORED VESSELS

A floating fuel dock, showboat, theater, hotel, restaurant, museum, etc. is not a "vessel" within the meaning of 1 U.S.C. 3 for inspection purposes if it is permanently moored and thus taken out of navigation. In this circumstance, the entity is "substantially a land structure" and not subject to the inspection laws. However, it may be subject to other regulations (such as those promulgated under the Ports and Waterways Safety Act).

The following criteria should be used in determining whether an entity is "substantially a land structure":

- The entity must be securely and substantially moored as approved by the OCMI;

- The mooring must be so rigged that the lines cannot be inadvertently or accidentally cast off, the structure is unlikely to break away from its mooring, and it cannot be moved away from the dock/pier/etc. without special effort (such as the use of tools);

- Permanent connection to shoreside facilities is evidence of being a "land structure." The nature and use of the entity may also be considered.

Several judicial decisions support these elements, and may be referred to for more guidance. The district legal officer should be consulted when there is doubt as to a particular entity's status. There is no simple rule, and the test of reason must prevail.

A vessel may be placed in navigation periodically and still retain its status as "substantially a land structure" when moored. When placed in navigation, it again becomes subject to the regulations applicable to the vessel's particular operation. The owner or operator must notify the cognizant OCMI prior to placing the vessel in navigation. When the vessel is again immobilized, the cognizant OCMI must approve the mooring arrangement before the vessel can be considered permanently moored. Once these conditions are met, the vessel would again be considered out of navigation and no longer subject to the inspection laws. However, if the owner chooses to have the vessel documented as a vessel of the United States, logically it can no longer be considered as "substantially a land structure." In addition, if the structure is to be used in a manner normally requiring inspection, the structure must be inspected and certificated prior to being documented as a vessel of the U.S.

The appropriate local authorities should be advised whenever a vessel's status is changed to "substantially a land structure" so that appropriate local safety codes may be applied.

30-10-50B. GROUNDED TANK VESSELS

Questions have been raised as to whether a vessel which is used for the storage of soya bean oil (a Grade E liquid) would be subject to inspection under 46 U.S.C. 391a if she were grounded at a suitable location and not afloat. Information has also been requested concerning the status of such a vessel if it were used for floating storage alongside a dock.

If such a vessel were completely grounded and not afloat, she would not be subject to inspection under 46 U.S.C. 391a. In order to be considered completely grounded, provisions would have to be made to ensure that the vessel remains grounded and fixed at all times, including times of unusually high water. In other words, to avoid inspection, the vessel must be so securely attached to the ground that it is not capable of being used in navigation and is "substantially a land structure." Therefore, it meets the provisions of section 30-10-25A, a vessel used for floating storage alongside a dock is subject to inspection and must comply with the requirements of 46 CFR 30-50 (Subchapter D - Tank Vessels).

30-10-50C. PERMANENTLY ANCHORED VESSELS

A permanently anchored vessel with public patronage on board, unless not subject to inspection as provided for in section 30-10-50A, is a passenger vessel engaged in navigation and subject to marine safety requirements, including inspection and certification. Such a vessel, whether self-propelled or not and whether underway or not, while operated as a public restaurant or hotel, would be subject to all statutes and regulations applicable to self-propelled passenger vessels.

30-10-50D. FOREIGN VESSELS

Prior to any determinations by the Coast Guard pertaining to foreign-built vessels intended for use in an immobile status, a determination regarding coastwise trade should be requested from the U.S. Customs Service by the vessel's owner.

30-10-55. BOY SCOUT VESSELS

In order to assist local Boy Scout councils, chartered organizations, and leaders in complying with Coast Guard inspection regulations, the Boy Scouts of America's Exploring Division and the Coast Guard entered into an agreement on 1 October 1979. While the agreement principally discusses the Sea Explorer program, it applies equally to all vessels operated in the interests of the Boy Scouts of America (BSA).

30-10-55A. INSPECTION AGREEMENT

It is the intent of the Exploring Division, BSA that all Sea Explorer vessels, except pulling boats carrying no more than six passengers, will be inspected and certificated. The Coast Guard will, upon proper application, inspect a Sea Explorer vessel and issue a COI when the vessel is found to comply with the appropriate regulations.

30-10-55B. APPLICABLE VESSEL REGULATIONS

The Rules and Regulations for Small Passenger Vessels, 46 CFR 175-187 (Subchapter T) are applicable to those vessels required to be certificated, or for which inspection is requested in accordance with this agreement.

The Rules and Regulations for Uninspected Vessels, 46 CFR 24-26 (Subchapter C) are applicable to those vessels not requiring certification.

30-10-55C. VESSELS REQUIRED TO BE INSPECTED

All Sea Explorer vessels 65 feet or less in length, which carry more than six passengers as defined in 46 U.S.C. 390(a), are required to be inspected and certificated under the provisions of Subchapter T.

Sea Explorer vessels of 100 G.T. or more may be inspected under Subchapter T. Where the provisions of Subchapter T are unsuitable, the provisions of Marine Engineering Regulations (Subchapter F), Rules and Regulations for Passenger Vessels (Subchapter H), and Electrical Engineering Regulations (Subchapter J) shall be used. The OCMI certificating the vessel shall determine the minimum manning requirements. The certificating officer may tailor a license examination covering minimum professional requirements only, and restrict the licensee to a particular vessel.

30-10-55D. VESSELS INSPECTED UNDER AGREEMENT

Certificates of Inspection may be issued to powered Sea Explorer vessels 65 feet or less in length and Sea Explorer sailing vessels under 700 G.T. which carry six passengers or less, upon successful completion of inspection under Subchapter T. Such vessels, when uninspected, must comply with the appropriate regulations of Subchapter C; annual application for a USCG Auxiliary Courtesy Motorboat Examination is encouraged.

It is recognized that a strict interpretation of the law does not require inspection and certification of vessels over 65 feet in length used exclusively for Sea Explorer activities. However, to ensure maximum safety, it is BSA policy that all Sea Explorer vessels over 65 feet in length possess a valid COI when carrying more than six passengers in addition to the crew.

All certificates issued to vessels not required to be inspected under the provisions of 46 U.S.C. 390-390g shall be endorsed, "This certificate is issued in accordance with terms of the USCG/BSA Inspection and Certification Agreement."

30-10-55E. PULLING BOATS

Sea Explorers engaged in the rowing of pulling boats are not considered passengers. Therefore, pulling boats are not required to be inspected for certification, and must comply with the appropriate regulations in Subchapter C.

30-10-55F. MANNING

Certificated vessels shall not be operated without the minimum manning specified on the COI. Sailing and powered vessels will be permitted to carry a reasonable number of Sea Explorers as crew members, not as passengers. The number in the crew shall be determined at the time of the inspection by the OCMI and shall be indicated on the COI.

The following guidelines are minimum crew requirements on vessels 65 feet or less in length. Evaluation for manning will consider the number of passengers carried, route, and general arrangement, in addition to the size of the vessel:

(1) Sailing Vessels Under 26 Feet LOA
  1 Operator
  2 Deckhands

(2) Sailing Vessels 26 Feet LOA and Larger
  1 Operator
  4 Deckhands

(3) Power Vessels Under 26 Feet LOA
  1 Operator
  1 Deckhand

(4) Power Vessels 26 Feet LOA and Larger
  1 Operator
  2 Deckhands

Powered vessels not having engine controls at the steering station shall require at least one additional crew member to provide for engine control.

When a vessel is cruising for more than 12 hours of continuous operation, the preceding minimum crew guidelines shall be doubled to provide for two separate watches.

30-10-55G. SPECIAL SITUATIONS

46 CFR 175.25-1 provides that the OCMI may give special consideration to departures from specific requirements when special circumstances or arrangements warrant such departures.

30-10-55H. RIGHT TO APPEAL

46 CFR 175.30-1 provides a procedure for appeal of decisions or actions of the OCMI. In addition, district commanders may arrange for a method of informal dispute settlement for minor disagreements.

30-10-55I. DETERMINATION OF SEAWORTHY CONDITION

When vessels are to be acquired for Sea Explorer use, it is encouraged that a marine inspector from the appropriate MSO/ MIO be invited by the National Sea Exploring Committee, BSA regional office, or BSA local council to assist in the examination of the vessel. The inspector may outline generally the vessel's suitability for the Sea Explorer program and the requirements for certification.

30-10-55J. ESTABLISHMENT OF POLICY, AGREEMENTS, AND LIAISON

The administrator of this agreement on behalf of Sea Exploring is the Director, National Sea Exploring Committee. All matters between the Coast Guard and Sea Explorers that are national in scope are resolved between the Commandant (or his designee) and the National Sea Exploring Committee (or its designee).

Liaison between the BSA's six geographical regions and Coast Guard district commanders for the implementation of this agreement by local councils, chartered organizations, and Sea Explorer leaders shall be the responsibility of the regional director or his designee. Liaison responsibilities include dispute resolution and establishment of implementation guidelines that recognize significant local conditions.

30-10-60. CABLE SHIPS

A cable-laying ship is subject to the regulations in Subchapter I. Since SOLAS 74 makes no reference to cable-laying ships or to other similar types in Regulation 3 with respect to exceptions, such vessels, when documented, come within the convention even though it is difficult to accurately categorize them as either passenger vessels or cargo ships. The Commandant will require the minimum arrangements which, having regard for the nature of the vessel's service and for inherent safety elements in the vessel's design and construction, can be considered equivalent to the requirements of SOLAS 74. In order to clarify the U.S. position in this regard, suitable notice of equivalency must be given as provided by Regulation 5, Chapter I, of SOLAS 74.

30-10-65. ELEVATOR VESSELS

The term "elevator vessel" as used in 46 U.S.C. 170, as amended, and in 46 CFR 146.02-2(f)(5), means a harbor service vessel that is used to load and discharge cargo vessels of bulk cargo, such as grain and ores, by means of elevator buckets. This type of vessel is classed in the same category as cable vessels, dredges, fireboats, icebreakers, pile drivers, pilot boats, and welding vessels (none of which carries freight as cargo for hire).

30-10-70. RECREATIONAL BOATS RENTED BY LAUNCH LIVERIES

Launch liveries have rented motorboats, including those propelled by outboard motors, to persons not familiar with safety measures required by the Motorboat Act of 1940 and the regulations promulgated thereunder. In some cases when a deposit for the safe return of lifesaving and other equipment required has been demanded, the renter of the boat has objected, and in certain instances these motorboats have been operated without the safety equipment required so that persons on board these vessels were without protection in case of emergency.

Section 16 of the Motorboat Act of 1940 (46 U.S.C. 526o) places responsibility on the owners of motorboats to see that the proper safety equipment is on board. Boats, including those propelled by outboard motors, must be equipped with proper life preservers or lifesaving devices. These safety devices, together with fire extinguishers, lights, and other equipment, are required by the Motorboat Act and the regulations promulgated thereunder.

Boats rented by launch liveries for recreational purposes shall carry the required lifesaving and fire protection equipment. Failure to have required equipment shall be investigated and appropriate action shall be instituted against the owner, as well as the actual operator, of the motorboat.

30-10-75. APPROVAL PROCEDURES FOR SPECIAL-TYPE CRAFT

30-10-75A. UNUSUAL DESIGNS.

The Coast Guard is occasionally requested to certificate various vessels of unusual design (e.g., floating drilling rigs, catamarans, hydrofoil vessels, surface effect ships, etc.) and vessels of seemingly traditional type (such as sailing vessels and sailing auxiliaries) which incorporate features requiring detailed evaluation. Experience in the operation of such craft is often very limited or may be totally lacking. Current regulations are based upon experiences with conventional craft and they may be unreasonable or quite inadequate to ensure an acceptable degree of safety for vessels of unique or unusual designs. To a lesser degree, current engineering data may also have limited applicability. For these reasons, such craft should be certificated only after evaluation by personnel of the cognizant field (mmt) unit or Commandant (G-MMT). The overall degree of safety for such vessels shall not be less than the minimum attained by application of current regulations to conventional craft.

30-10-75B. EVALUATIONS AND APPROVALS

Whenever a request is received for certification of a special-type craft, pertinent plans, specifications, and design calculations should be obtained and forwarded to the cognizant field (mmt) unit for evaluation and approval. Any submittal which is considered by the field (mmt) unit to be beyond its capabilities or knowledge or which requires important policy decisions shall be forwarded with that unit's recommendations to Commandant (G-MMT) for evaluation and approval.

30-10-80. INTEGRATED TUG-BARGES

(To be developed.)

30-10-85. HYDROFOILS AND AIR CUSHION VEHICLES

(To be developed.)

30-10-90. OIL-RECOVERY VESSELS

30-10-90A. GENERAL

Since the first oil recovery vessels were built, Coast Guard plan review and inspection efforts have been guided by a wide variety of criteria, each primarily dependent upon the individual situation. This subpart sets forth a consolidated and consistent approach to plan review and inspection of oil recovery vessels.

At present, the Coast Guard's statutory responsibility regarding oil recovery equipment extends only to those oil recovery vessels which carry combustibles or inflammables in bulk. 46 U.S.C. 391a requires that these vessels be certificated by the Coast Guard. Vessels carrying not more than 110 gallons of oil on board and "equipment" operated from vessels not requiring inspection are not regulated under the authority of the Tank Vessel Act.

Although 46 CFR, Subchapter D was promulgated as a result of the act, it was not drafted with regard to possible application to oil recovery vessels. Its present use produces unnecessary hardships on builders, resulting in a product so costly that the market is generally limited to Government agencies. Equipment which will improve response to oil pollution incidents should be encouraged, and, pending development of applicable regulations, an alternate approach to the regulation of oil recovery vessels is needed. It appears that self-propelled oil recovery vessels as large as 300 G.T. should possibly be subject to criteria less stringent than existing inspection requirements. However, until such time as further study is completed, existing requirements of Subchapter D and other appropriate subchapters shall be applied to oil recovery vessels of 100 or more G.T. as a general rule.

(NOTE: The remainder of this subpart addresses oil recovery vessels under 100 G.T. Subchapter D shall be applied as it pertains to the mechanics of issuance and maintenance of the COI only; the actual inspection requirements shall be given separate treatment as noted below.)

30-10-90B. PLAN APPROVALS

The requirements contained in 46 CFR, Subchapter C (Uninspected Vessels) and any other requirements which are normally applicable to uninspected vessels, including a requirement that the design and construction must be in accordance with good marine practice, shall be used as minimum standards for plan approval. Technical plan review is not envisioned, but some drawings may be required by the OCMI in the course of inspection.

30-10-90C. INSPECTIONS

The following minimum standards for "ignition protection" shall apply:

(1) Electrical equipment installations should be kept to a minimum. Hydraulically-powered equipment should be used when available (e.g., hydraulically-powered cargo pumps);

(2) Where electrical equipment is employed (switches, lights, solenoid valves, etc.), it must possess one of the following ratings:

(a) Spark ignition-proof (UL 1500);
(b) Explosion-proof (various); or
(c) Intrinsically safe (UL 913);

(NOTE: The UL listing "spark ignition-proof" (UL 1500) employs a standard which is based on part of the explosion-proof test. Those electrical devices which do not create sparks in normal operation (lights, solenoids, etc.) would be inherently "spark ignition-proof" and can (should) obtain UL listing.)

(3) Enclosed machinery spaces must be ventilated at a rate of at least 20 changes of air per hour by fans either designated as "nonsparking" under the provisions of 46 CFR 110.15-175(1) or paragraph (2) above;

(4) Belt drives must use conducting belts, pulleys, and shafts to prevent the buildup of static electrical charges;

(5) Machinery exhausts must be fitted with spark arrestors;

(6) All exposed surfaces (machinery, light lenses, etc.) must be maintained at a temperature below 400°F. When these surfaces are normally accessible to personnel they must be maintained below 150°F for personnel protection;

(7) Oil tank vents must be fitted with flame screens and must have a cross-sectional area at least as large as the fill lines.

30-10-90D. CERTIFICATE OF INSPECTION

As a practical measure, the COI may be endorsed for Grades D & E combustible liquids. Requests for other cargo endorsements should be referred to Commandant (G-MVI). This limitation has been selected in recognition of the fact that the standards of safety prescribed herein may not be adequate for spills of higher grades. Conversely, the operational safety record of oil recovery vessels and other recovery equipment in handling spills of Grades D & E has been good, and it is recognized that hazards associated may not be sufficient to warrant even these minimal standards. A Headquarters study is being initiated to determine whether there is a limiting grade of cargo below which ignition protection is unnecessary. Particular attention will be given to the weathering process of oil on water and its effect upon the ignition potential of the light ends of crude oils. The additional hazards associated with the recovery of spilled chemicals are not addressed in this subpart, and requests for endorsement of the certificate for such products shall be referred to Commandant (G-MVI).

The COI should indicate that the vessel is an oil recovery vessel; the route should be as broad as possible to accommodate transportability, yet not be so broad as to permit operation in areas where the vessel may not be seaworthy. Oil recovery vesels, responding to pollution incidents, may be expected to be placed into service at great distances from home ports. The need for these vessels can be expected, at times, for oil recovery operations upon open oceans. These vessels, when engaged in oil recovery operations, are normally in close proximity of other vessels. In these instances, a restricted route would be neither desirable nor necessary (see plate 30-10-90D.1 for a sample COI for an oil-recovery vessel).

Multi-purpose vessels employed in the recovery of spilled oil are not exempted from meeting the applicable requirements for their alternate service. For example, a skimmer used to transport another vessel's oil slops would be subject to Subchapter D regulations as a tank vessel.

30-10-95. LANDING CRAFT-TYPE VESSELS

30-10-95A. GENERAL

Landing craft of the types developed for use by the armed services in wartime are designed for special purposes. These vessels are of lighter construction than normal merchant ships, and the opening bow door design presents watertight integrity problems not found on conventional vessels. The Coast Guard strongly discourages the use of these vessels for commercial service.

When landing craft have been permitted to be used commercially, special consideration has been given to their suitability for the proposed operations. In some instances, the hull structure has been required to be strengthened before the vessel is certificated. In all cases where they have been permitted to carry passengers, and in most cases of carrying only cargo, a requirement has been made that bow doors be permanently closed. In the case of some cargo vessels where the bow door was retained, indiscriminate beaching was not permitted, and suitable shore facilities had to be provided.

OCMI's shall continue to give particular attention to vessels of the landing craft types. The construction, arrangement, equipage, and material condition of each particular vessel shall be considered in determining whether it is suitable for the proposed operation. Each new request for inspection of such a vessel must be evaluated on its own merits. Unless covered by the following provisions, each new application should be referred to Commandant (G-MVI) with appropriate recommendations from the OCMI.

30-10-95B. LST'S

NVC 7-56 and NVC 11-63 contain instructions and information concerning the structural reinforcement, drydocking, and hull inspection requirements for manned and unmanned Landing Ships, Tanks (LST's), respectively. Since the issuance of these circulars, the following additional requirements have been applied:

(1) Further bottom reinforcing in addition to that shown by Figure 1 of NVC 7-56 is required, so as to provide at least 14 square inches of additional bottom plating sectional area on each side of the centerline. This may be provided by strapping or by increasing the width of the 9/16-inch thick strakes at the centerline and in way of the longitudinal bulkheads;

(2) Existing machinery, pressure vessels, piping systems, electrical installations, lifesaving and firefighting equipment, etc. which will not be used must be removed or inactivated so as not to constitute a safety hazard. Any original equipment or systems designed for use in the proposed service shall comply with the applicable regulations.

Plans covering in full detail all modifications from the basic LST structure and configuration, including those called for in NVC 7-56, NVC 11-63, and this subpart, shall be submitted to and approved by Commandant (G-MMT) before initial certification. These plans should be submitted well in advance of alterations or operations planned for a vessel.

30-10-95C. LCU'S, LCM'S, AND LCT'S

Landing Craft, Utility (LCU's), Medium (LCM's), and Tanks (LCT's) with bow doors in use have been permitted to carry cargo on waters considered to be semi-protected. In such operation the following conditions apply:

(1) The OCMI must be satisfied as to the material condition of the vessel and its meeting of equipment requirements;

(2) Appropriate conditions and limitations, including the qualification of routes to reasonable operating conditions, shall be stated on the COI;

(3) Provisions should be made to overcome legal requirements to report each grounding. Therefore, the following statement shall be entered on the COI of a landing craft:

"Notice of casualty in accordance with 46 CFR 97.07-1 (a)(3) shall be made for any accidental stranding or grounding and for any intentional grounding which causes or is suspected of having caused damage affecting the seaworthiness of the vessel";

(4) The cargo capacity of such vessels shall not exceed that prescribed by the following table:

VESSEL & LENGTH	PROTECTED WATERS/ NO BEACHING	SEMI-PROTECTED WATERS/ BEACHING
LCM (50, 56 ft)	30 Tons (Short)	20 Tons
LCT (117, 120 ft)	150 Tons	100 Tons

(5) Bow and stern sections of LCT's shall be welded to center sections.

30-10-100. YACHTS

30-10-100A. GENERAL

Yachts are not exempt from vessel inspection laws, and are treated as any other motor-propelled vessel in the application of the laws.

30-10-100B. STEAM-PROPELLED YACHTS

Steam-propelled yachts are subject to the provision of 46 U.S.C. 526 "... that the engine, boiler, or other operating machinery shall be subject to inspection by the Coast Guard, and to its approval of the design thereof, on all said motorboats, which are more than forty feet in length, and which are propelled by machinery driven by steam." In this regard, the machinery and boilers of such vessels are subject to annual inspections and letters of inspection are issued. Steam-propelled yachts over 65 feet in length are subject to full inspection for certification under Subchapter T.

30-10-100C. MOTOR-PROPELLED YACHTS

Motor-propelled yachts of 300 or more G.T. operating coastwise or on the high seas are subject to full inspection for certification under Subchapter I (as provided by 46 U.S.C. 367).

30-10-100D. MANNING

Subpart 52-6-55 (Volume III of this manual) discusses manning standards for pleasure yachts.

PLATE 30-10-10D.1
SAMPLE WRITTEN NOTICE TO THE OWNER OF A SMALL PASSENGER VESSEL

OFFICER IN CHARGE, MARINE INSPECTION
U.S. COAST GUARD

(Port)

(Date)

(Name), OWNER

SMALL PASSENGER VESSEL (Name)

(Address)

Dear Sir:

As the owner of a small passenger vessel which was formerly certificated by the Coast Guard, but which no longer has a valid Certificate of Inspection, you are hereby informed of the following:

(1) You may not operate your vessel carrying more than six passengers unless you first correct any deficiencies and have your vessel inspected and re-certificated for passenger service;

(2) If you dispose of your vessel by sale, transfer, or other means, you are requested to inform the new owner of his obligation to obtain a valid Certificate of Inspection before operating the vessel carrying more than six passengers;

(3) If you dispose of your vessel by sale, transfer, or any other means, you are requested to inform the local Coast Guard Office in Charge of Marine Inspection of the name and address of the new owner. This notification should be accomplished within 48 hours of the transfer of ownership;

(4) Continued operation or use of this vessel, for any purpose, in an unseaworthy condition may constitute negligent use under the Federal Boat Safety Act of 1971. This negligent use may subject your to civil or criminal penalties.

A copy of this letter has been placed in your vessel's official file at this office and a copy has been forwarded to the vessel's port of documentation.

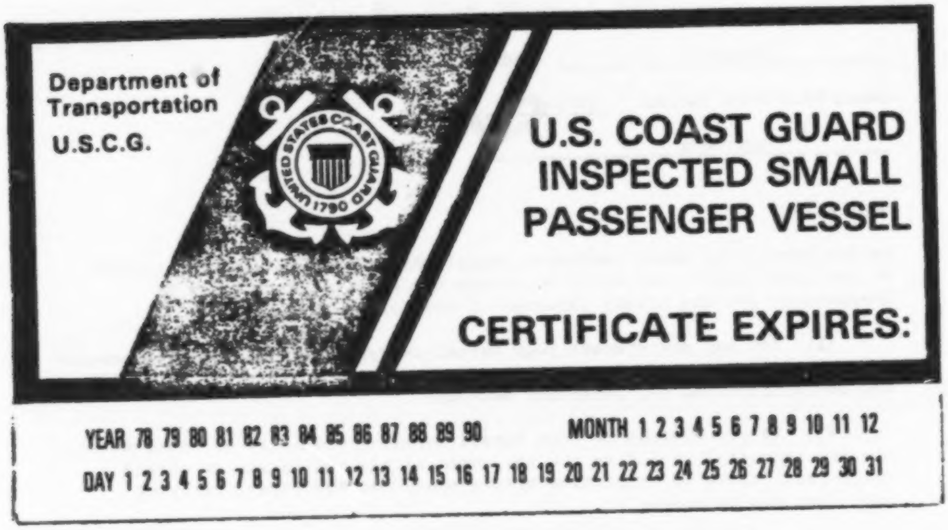
Sincerely,

(Signature)

(Title)

Plate 30-10-10I(2).1.

Certification Expiration Date Sticker for 46 CFR Subchapter T Vessels



Department of Transportation
U.S.C.G.

U.S. COAST GUARD
INSPECTED SMALL
PASSENGER VESSEL

CERTIFICATE EXPIRES:

YEAR 78 79 80 81 82 83 84 85 86 87 88 89 90 MONTH 1 2 3 4 5 6 7 8 9 10 11 12

DAY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

NOTES:

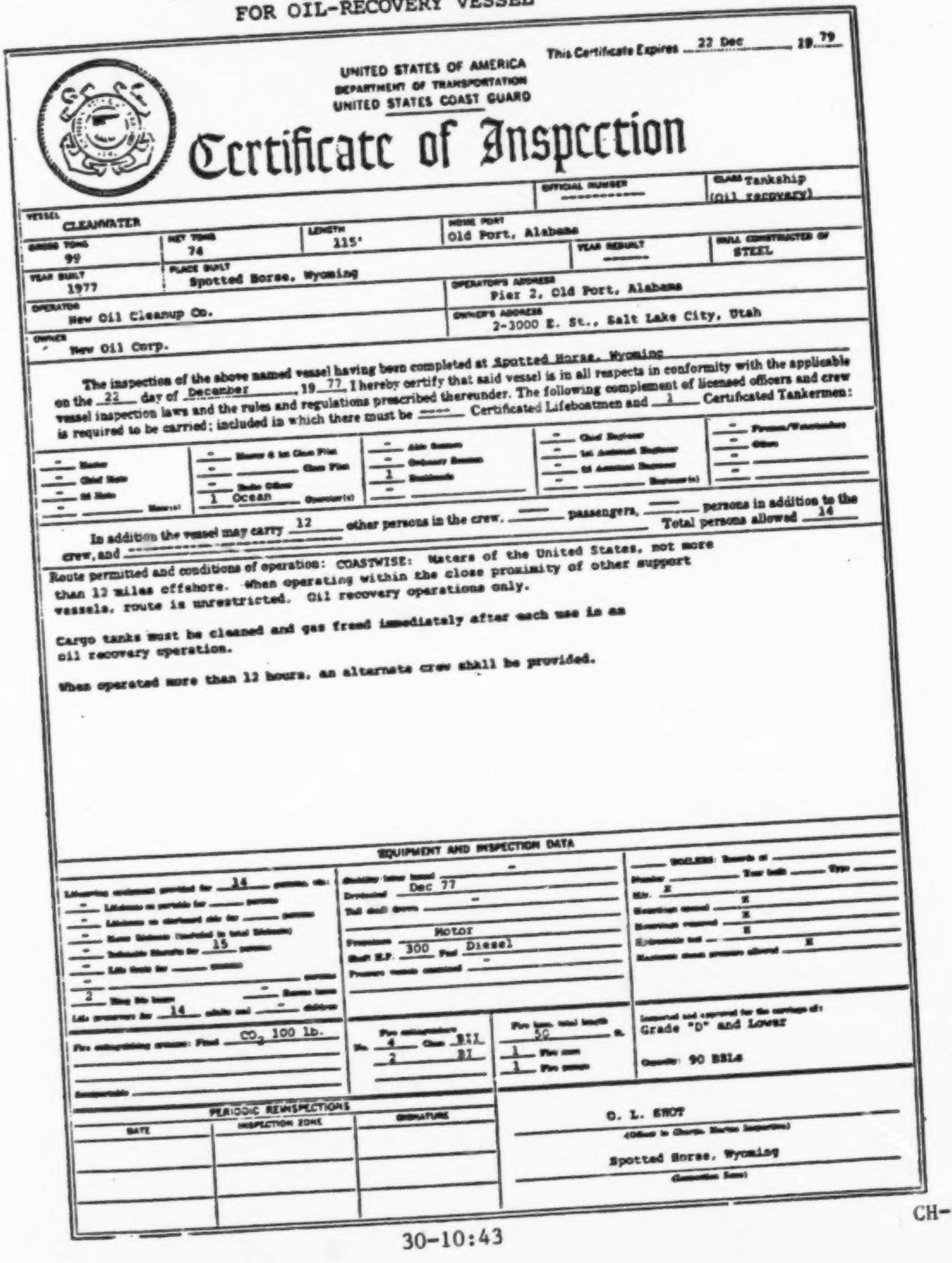
(1) The actual sticker is Coast Guard red and Coast Guard blue on a white background in the actual size shown above.

(2) The sticker has adhesive on the back with a peel-off cover. The adhesive is not adjustable and care should be exercised in placing the sticker on vessels. After a short time in place, the sticker will probably not be removable without destroying it. Removal of old stickers may require the use of a razor-blade-type of scraping device.

(3) Stickers can be obtained from the Coast Guard Supply Center, Brooklyn, New York using stock number 7510-01-GF2-8620.

(4) Adhesive-backed materials have a finite shelf life, especially considering the need to withstand three years of exposure to a marine environment. It is recommended that supplies be stored in a controlled atmosphere (i.e., heated and air conditioned) and that excess quantities not be ordered. Annual ordering based on annual needs is appropriate.

MARINE SAFETY MANUAL
PLATE 30-10-90D.1
SAMPLE CERTIFICATE OF INSPECTION FOR OIL-RECOVERY VESSEL



This Certificate Expires 22 Dec 19 79

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Certificate of Inspection

OFFICIAL NUMBER: ----------			CLASS: Tankship (Oil recovery)	
VESSEL: CLEANWATER				
GROSS TONS: 99	NET TONS: 74	LENGTH: 115'	HOME PORT: Old Port, Alabama	
			YEAR REBUILT: ------	HULL CONSTRUCTED OF: STEEL
YEAR BUILT: 1977	PLACE BUILT: Spotted Horse, Wyoming			
OPERATOR: New Oil Cleanup Co.			OPERATOR'S ADDRESS: Pier 2, Old Port, Alabama	
OWNER: New Oil Corp.			OWNER'S ADDRESS: 2-3000 E. St., Salt Lake City, Utah	

The inspection of the above named vessel having been completed at Spotted Horse, Wyoming on the 22 day of December, 19 77, I hereby certify that said vessel is in all respects in conformity with the applicable vessel inspection laws and the rules and regulations prescribed thereunder. The following complement of licensed officers and crew is required to be carried; included in which there must be ---- Certificated Lifeboatmen and 1 Certificated Tankermen:

- Master	- Master & 1st Class Pilot	- Able Seamen	- Chief Engineer	- Firemen/Watertenders
- Chief Mate	- Class Pilot	- Ordinary Seamen	- 1st Assistant Engineer	- Oilers
- 2d Mate	- Radio Officer	1 Deckhands	- 2d Assistant Engineer	-
- Mate(s)	1 Ocean Operator(s)	-	- Engineer(s)	-

In addition the vessel may carry 12 other persons in the crew, ---- passengers, ---- persons in addition to the crew, and ---------- Total persons allowed 14

Route permitted and conditions of operation: COASTWISE: Waters of the United States, not more than 12 miles offshore. When operating within the close proximity of other support vessels, route is unrestricted. Oil recovery operations only.

Cargo tanks must be cleaned and gas freed immediately after each use in an oil recovery operation.

When operated more than 12 hours, an alternate crew shall be provided.

EQUIPMENT AND INSPECTION DATA

Lifesaving equipment provided for 14 persons, viz:
- Lifeboats on port side for ---- persons
- Lifeboats on starboard side for ---- persons
- Motor lifeboats (included in total lifeboats)
- Inflatable liferafts for 15 persons
- Life floats for ---- persons
- ---- persons
2 Ring life buoys - [illegible]
Life preservers for 14 adults and - children

Stability letter issued -
Drydocked Dec 77
Tail shaft drawn -
Propulsion Motor
Shaft H.P. 300 Fuel Diesel
Pressure vessels examined -

BOILERS: [illegible]
Number ---- [illegible] ---- Type ----
Mfr. X
[illegible] X
[illegible] X
Hydrostatic test X
Maximum steam pressure allowed X

Fire extinguishing systems: Fixed CO$_2$ 100 lb.
Sprinklers ----

Fire extinguishers No. 4 Class BII
2 BI

Fire hose, total length 50 ft.
1 Fire axes
1 Fire pumps

Inspected and approved for the carriage of: Grade "D" and Lower
Quantity: 90 BBLs

PERIODIC REINSPECTIONS

DATE	INSPECTION ZONE	SIGNATURE

O. L. SHOT
(Officer in Charge, Marine Inspection)

Spotted Horse, Wyoming
(Inspection Zone)

*U.S. GOVERNMENT PRINTING OFFICE: 1981-0-341-428/1181

Sa 1/2/v.2/Ch.5

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-MP-5)
WASHINGTON, D.C. 20590
PHONE: (202) 426-9776

COMDTNOTE 16000
26 JUN 1980

COMMANDANT NOTICE 16000

CANCELLED: 26 DEC 1980

Subj: CH-5 to Volume II - MATERIAL INSPECTION of the Marine Safety Manual, COMDTINST 16000.3 (old CG-495)

1. PURPOSE. This Notice transmits a change to Volume II - MATERIAL INSPECTION of the Marine Safety Manual by adding part 49-4 (Commercial Diving Equipment and Operations) and section 38-1-1D, and indicating pen-and-ink corrections to the volume.

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AUG 29 1980
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DEPOSITORY 376

2. ACTION.

a. Remove and insert the following pages:

Remove	Insert
38-1:1 through 38-1:2	38-1:1 through 38-1:2, CH-5
49-0:1	49-0:1, CH-5
	49-4:1 through 49-4:9, CH-5

b. Make the following pen-and-ink corrections:

(1) Paragraph 32-1-20A(2), page 32-1:5, delete CAPT J. C. MUSSER and telephone number.

(2) Section 36-1-15D, page 36-1:6, delete and amend to read, "See subpart 87-5-15 of the manual."

c. Make an entry on the "Record of Changes" page at the front of the volume.

DISTRIBUTION - SDL No. 111

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
A																										
B	*	4	15*		5		2	*		5				200	1			1								
C					*		2		*			2	*												1	
D	1	2		1							1*	*														
E		2											2	2	*				1							
F	1		1							1									24							
G																										
H																										

NON-STANDARD DISTRIBUTION: (See page 2.)

TD5.8:

3. CHANGES. Recommendations for changes to the Marine Safety Manual should be forwarded on Form CG-5122 which has been supplied with the manual.

Henry H Bell
HENRY H. BELL
Chief, Office of Merchant Marine Safety

Encl: (1) CH-5 to Volume II, COMDTINST 16000.3

Non-Standard Distribution:

B:a Commandant (G-MP-5) only (1)
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C:i Pago Pago only (1).
C:m New Orleans (120); New York (69); Seattle (35); Philadelphia (32); Long Beach (25); Houston (24); St. Ignace (8); Rotterdam (6).
D:k New York (3); Jacksonville, Houston, New Orleans, San Francisco (1) (extra).
D:l CG Liaison Officer, NWC only (1).
E:o Long Beach (25); New Orleans (16); New York (15); Houston (12); Philadelphia (6); Seattle (5); New Haven, Muskegon (4); Sault Ste. Marie (3); Humboldt Bay, Monterey (2); New London (1).

Panama Canal Zone Liaison Officer (1).
NTSB (Marine Accidents Division only) (2).
DoJ Torts Branch (Washington D.C., New York, San Francisco only) (1).

Sa 1/2/v.2/ch.4

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-MP-3/MSM)
WASHINGTON, D.C. 20590
PHONE: (202) 426-9776

NOV 21 1979
U. S. GOVT. DOCS
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COMDTNOTE 16000

6 SEP 1979

COMMANDANT NOTICE 16000 CANCELLED: 29 February 1980

Subj: CH-4 to Volume II - MATERIAL INSPECTION of the Marine Safety Manual (CG-495)

1. PURPOSE. This Notice transmits a change to Volume II - MATERIAL INSPECTION of the Marine Safety Manual (CG-495) by adding section 31-3-20C (LASH Vessel Lighter Cranes) and a subject index to the volume.

2. DISCUSSION. Section 31-3-20C discusses the need for improved safety precautions in the operation of Lighter-Aboard-Ship (LASH) vessel cranes. This need has been amplified by the recent deaths of five persons due to inadequate precautions taken during the lighter discharging process.

3. ACTION.

   a. Remove and insert the following pages:

Remove	Insert
31-3:11 through 31-3:29, CH-1	31-3:11 through 31-3:30, CH-4

   b. Insert the subject index, pages II:1 through II:28, CH-4, at the back of the volume.

   c. Make an appropriate entry on the "Record of Changes" page which has been inserted at the front of the volume.

DISTRIBUTION - SDL No. 109

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
A																										
B		4	15		5		2	*		5				200	1	1	2	1								
C					*		2					2	*												1	
D	1	2		1							1*	*														
E		2											2	2	*				1							
F	1		1							1									24							
G																										
H																										

NON-STANDARD DISTRIBUTION: (See page 2.)

TD 5.8:

4. CHANGES. Suggestions for improvements to the Marine Safety Manual should be made on Form CG-5122 which has been supplied with the Manual.

Henry H. Bell
HENRY H. BELL
Chief, Office of Merchant Marine Safety

Encl: (1) CH-4 to Volume II, CG-495

Non-Standard Distribution:

B: h (Alameda only) (2).
C: e San Francisco (52); Baltimore (38); Hampton Roads (34); Port Arthur (28); Miami (24); Mobile, Chicago (22); Boston, Portland OR (20); Jacksonville, Galveston, San Diego (18); Honolulu (16); Charleston (13); Portland ME, St. Louis, Tampa, Corpus Christi, Cleveland, Detroit, Duluth, Toledo (12); Guam (11); Providence, Pittsburgh, Wilmington, Buffalo (10); San Juan, Savannah (9); Huntington, Louisville, Memphis (8); Paducah (7); Cincinnati, Nashville, Albany, Milwaukee, Minneapolis-St. Paul, Anchorage, Juneau, Valdez (6); Sturgeon Bay (2).
C: m New Orleans (120); New York (65); Seattle (32); Philadelphia (28); Los Angeles-Long Beach (25); Houston (18); St. Ignace (8); Rotterdam (6).
D: k New York (3); Jacksonville, New Orleans, Houston, San Francisco (1) (extra).
D: l (Naval War College Advisor only)(1).
E: o New York (22); New Orleans (16); Houston (12); Philadelphia, Seattle (10); Los Angeles-Long Beach (8); Sault Ste. Marie (6); Muskegon (4); New Haven, New London, Humboldt Bay, Monterey (2).
Panama Canal Zone Liaison Officer (1).

Sa 1/2/v.2/ch.3

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

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WASHINGTON, D.C. 20590
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COMDTNOTE 16000
29 OCT 1979

COMMANDANT NOTICE 16000

CANCELLED: 31 January 1980

Subj: CH-3 to Volume II - MATERIEL INSPECTION of the Marine Safety Manual (CG-495)

1. PURPOSE. This Notice transmits a change to Volume II - MATERIEL INSPECTION of the Marine Safety Manual by adding chapters 47 and 48, revising part 32-2, and indicating a pen-and-ink correction to the volume.

2. DIRECTIVES AFFECTED. Part 12-3 of the Merchant Marine Safety Manual (CG-203) is superseded and cancelled by chapter 48.

3. SUMMARY OF CHANGES. The information in sections 32-2-5B and 32-2-5C has been updated and clarified. The information required on various vessel inspection certificates has been updated and clarified in part 48-2.

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4. ACTION.

   a. Remove and insert the following pages:

Remove	Insert
32-2:1 through 32-2:19, CH-1	32-2:1 through 32-2:15, CH-3
47-0:1 (To be developed)	47-0:1 through 47-11:1, CH-3
48-0:1 (Reserved)	48-0:1 through 48-2:16, CH-3

   b. Make the following pen-and-ink correction:

      (1) Add the words "RECORDS, REPORTS, & CERTIFICATES" to the tabbed divider entitled "CHAPTER 48".

DISTRIBUTION - SDL No. 109

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
A																										
B		4	15		5		2			5				200	1	1	2	1								
C					*		2					2	*												1	
D	1	2		1							1*	*														
E		2											2	2	*				1							
F	1		1							1									24							
G																										
H																										

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Washington, D.C. 20402

TD 5.8:

c. Make an entry on the "Record of Changes" page which has been inserted in the front of the volume.

5. CHANGES. Feedback from field units plays a significant role in improving the Marine Safety Manual. Suggestions for improvements should be made on Form CG-5122 which has been supplied with the manual.

Henry H. Bell
HENRY H. BELL
Chief, Office of Merchant Marine Safety

Encl: (1) CH-3 to Volume II, CG-495

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C: m New Orleans (120); New York (65); Seattle (32); Philadelphia (28); Los Angeles-Long Beach (25); Houston (18); Miami (12); St. Ignace (8); Rotterdam (6).
D: k New York (3); Jacksonville, New Orleans, Houston, San Francisco (1) (extra)
D: l (Naval War College Advisor only)(1).
E: o New York (22); New Orleans (16); Houston (12); Philadelphia, Seattle (10); Miami, Los Angeles-Long Beach (8); Sault Ste. Marie (6); Muskegon (4); New Haven, New London, Humboldt Bay, Monterey (2). Panama Canal Zone Liaison Officer (1).

Sa 1/2/v.2/ch.2

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

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WASHINGTON, D.C. 20590
PHONE: (202) 426-9776

COMDTNOTE 16000

1 MAR 1979

COMMANDANT NOTICE 16000 CANCELLED: 1 July 1979

Subj: CH-2 to Volume II - MATERIEL INSPECTION of the Marine Safety Manual, CG-495.

1. PURPOSE. This Notice transmits a change to Volume II of the Marine Safety Manual (CG-495) by adding Part 30-14 (Tests and Inspections of Inert Gas Systems) to the Volume. This Notice also transmits miscellaneous pen-and-ink corrections to the Volume.

2. ACTION.

a. Remove and insert the following pages:

Remove	Insert
30-0:3 and :4, CH-1	30-0:3 and :4, CH-2 30-14:1 through 30-14:13, CH-2

APR 19 1979
U. S. GOVT. PUBS.
DEPOSITORY

b. Make the following pen-and-ink corrections:

(1) On page 30-6:13, section 30-6-25B, delete the two sentences which read "The inspector shall insure...means of attachment, etc." (These sentences were inadvertantly printed within the INSPECTION STANDARDS section.)

(2) On page 30-12:4, delete the entire paragraph 30-12-20C(3) (Manning), and change paragraph 30-12-20C(4) to 30-12-20C(3).

(3) On page 33-3:3, paragraph 33-3-10A(4) (Delayed Cracking and Inspection Problems), the formula in the second paragraph should read:

$$C.E. = \%C + \frac{\%Mn}{4} + \frac{\%Cr}{10} + \frac{\%Ni}{20} + \frac{\%Mo}{50} + \frac{\%Cu}{40} - \frac{\%V}{10}$$

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	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
A																										
B		3	15		5		2	2		5				200	1	1	2	1								
C					*		2					2	*												1	
D	1	2		1							1*															
E		2											2	2	*				1							
F			1								10					4										
G																										
H																										

NON-STANDARD DISTRIBUTION: (See page 2.)

TD 5.8:

(4) On page 38-1:4, section 38-1-30A, change "46 CFR part 145" to read "33 CFR part 145."

c. Make an appropriate entry on the "Record of Changes" page in the front of the Volume.

3. CHANGES. Recommendations for improvement of the Marine Safety Manual should be submitted on form CG-5122 which has been supplied with the Manual.

Henry H. Bell

HENRY H. BELL
Chief, Office of Merchant Marine Safety

Encl: (1) CH-2 to Volume II, CG-495

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C: m New Orleans (76); New York (65); Seattle (32); Philadelphia (28); Los Angeles-Long Beach (25); Houston (18); Miami (12); St. Ignace (25); Rotterdam (6).
D: k New York (3); New Orleans, Houston, San Francisco (1); extra.
E: o New York (22); New Orleans (16); Houston (12); Philadelphia, Seattle (10); Los Angeles-Long Beach (8); Sault Ste. Marie (6); Muskegon, Miami (4); Key West, New London, New Haven, Humboldt Bay, Monterey (2).

Sa 1/2/v.2/ Ch.1

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UNITED STATES COAST GUARD

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COMDTNOTE 16000
30 NOV 1978

COMMANDANT NOTICE 16000 CANCELLED: 1 April, 1979

Subj: CH-1 to Volume II - MATERIEL INSPECTION of the Marine Safety Manual, CG-495.

NEWARK PUBLIC LIBRARY
JAN 5 1979
U. S. GOVT. PUBS.
DEPOSITORY 376

1. PURPOSE. This Notice provides a change to Volume II - MATERIEL INSPECTION of the Marine Safety Manual, CG-495, by adding chapters 30, 31, 32, 33, 36, and 39 to the Volume. (Chapter 32 contains all current guidance on administrative procedures concerning the application of U.S. regulations to foreign-flag vessels.)

2. DIRECTIVES AFFECTED.

   a. Chapters 3 and 4 of the Merchant Marine Safety Manual, CG-203, COMDTINST 16455.1, and COMDTINST 16711.1 are hereby cancelled. The non-superseded chapters of CG-203 remain in effect.

   b. The information contained in COMDTNOTE 16703 of 23 Aug. 78, COMDTNOTE 16711 of 18 Sept. 78, and COMDTNOTE 16732 of 18 Aug. 77 has been included in this change.

   c. COMDTNOTE 16000 of 19 Sept. 78 (CH-1 to Vol. II, CG-495) which was listed in Commandant's Bulletin 40-78 of 19 Sept. 78, and COMDTNOTE 16000 of 2 Nov. 78 (CH-2 to Vol. II, CG-495) which was listed in Commandant's Bulletin 46-78 of 13 Nov. 78 will not be printed and distributed. The information in these notices has also been included in this change.

3. DISCUSSION. Requests are being received by Commandant (G-MP-3/MSM) for replacement copies of the Marine Safety Manual due to personnel transfers, etc. Each volume of the Manual and its changes are a permanent part of the unit's publication allowance and are not the

DISTRIBUTION - SDL No. 108

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
A																										
B		3	15		2		2	2		5				200	1	1	2	1								
C					*		2					2	*												1	
D	1	2		1							1*															
E		2											2	2	*											
F			1								10					4										
G																										
H																										

NON-STANDARD DISTRIBUTION: (See page 3.)

TD 5.8

COMDTNOTE 16000

30 NOV 1978

3. (cont'd) personal property of assigned personnel. Should anyone mistakenly carry away a Manual, or if replacement/extra copies are needed for any reason, the instructions contained in the Directives, Publications and Reports Index, CG-236, should be followed.

4. ACTION.

   a. Remove and insert the following pages:

Remove	Insert
30-0:1 (To be developed.)	30-0:1 through 30-13:5, CH-1
31-0:1 (To be developed.)	31-0:1 through 31-4:2, CH-1
32-0:1 (To be developed.)	32-0:1 through 32-4:3, CH-1
33-0:1 (To be developed.)	33-0:1 through 33-5:3, CH-1
36-0:1 (To be developed.)	36-0:1 through 36-5:3, CH-1
39-0:1 (To be developed.)	39-0:1 through 39-3:5, CH-1
	"Record of Changes" page

   b. Make an appropriate entry on the "Record of Changes" page which has been inserted in front of the volume.

5. CHANGES. Recommendations for improvement of the Marine Safety Manual should be submitted on form CG-5122 which has been supplied with the Manual.

W. D. [illegible]
Acting Chief, Office of Merchant Marine Safety

Encl: (1) CH-1 to Volume II, CG-495

Non-Standard Distribution:

C: e San Francisco (52); Baltimore (38); Hampton Roads (34); Port Arthur (28); Mobile (22); Boston, Portland, OR (20); Jacksonville, San Diego, Galveston (18); Honolulu (16); Charleston (13); Portland, ME, St. Louis, Tampa, Corpus Christi, Cleveland, Detroit, Duluth, Toledo (12); Pittsburgh, Wilmington, Providence (10); San Juan, Savannah (9); Huntington, Louisville, Memphis, Buffalo (8); Paducah (7); Cincinnati, Nashville, Albany, Guam, Anchorage, Valdez, Juneau, Minneapolis-St. Paul (6).

C: m New Orleans (76); New York (65); Seattle (32); Philadelphia (28); Los Angeles-Long Beach (25); Chicago (20); Houston (18); Miami (12); St. Ignace (25); Rotterdam (6).

D: k New York (3); New Orleans, Houston, San Francisco (1). (extra)

E: o New York (22); New Orleans (16); Houston (12); Philadelphia, Seattle (10); Los Angeles-Long Beach (8); Sault Ste. Marie (6); Milwaukee, Muskegon, Miami (4); Key West, New London, New Haven, Humboldt Bay, Monterey, Chicago (2).

MARINE SAFETY MANUAL
(CG-495)
Volume II - MATERIEL INSPECTION

RECORD OF CHANGES

CHANGE NUMBER	DATE OF CHANGE	DATE ENTERED	BY WHOM ENTERED

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-MP-3/MSM)
WASHINGTON, D.C. 20590
PHONE: (202) 426-9776

17 OCT 1977

MARINE SAFETY MANUAL
(CG-495)
Volume II - MATERIEL INSPECTION

LETTER OF PROMULGATION

1. Purpose. Volume II of the Marine Safety Manual (CG-495) is promulgated for the use, assistance and guidance of all Coast Guard personnel assigned to marine safety duties. It presents the authority, background and rationale for the various activities associated with vessel, facility and equipment inspections, and prescribes the essential functions which must be performed in order to attain the overall marine safety objectives of the Coast Guard.

2. Publications and Directives Affected. None.

3. Discussion.

a. A clearly defined and well-disseminated policy is indispensable to the successful conduct of the Coast Guard's marine safety program. This volume is intended to present such a policy that covers the entire scope of materiel inspection activities performed by the COTP and OCMI. These activities are included in the programs of Commercial Vessel Safety (CVS), Port Safety and Security (PSS), and Marine Environmental Protection (MEP).

b. The provisions of this volume may not, however, cover certain marine safety situations which may be best handled with experienced good judgment. Hence, the policies and instructions issued herein are advocated as a guide for executing consistent and uniform administration of the marine safety program, without unduly hampering independent action and situational judgment by marine safety personnel.

c. All personnel, operating units, and levels of management are encouraged to use the enclosed mailer, form CG-5122, when offering substantive comments and input regarding improvement of the manual. This is particularly important in view of the amount of new and revised marine safety policy contained in this manual which has not been subjected to field evaluation. New policy and significant changes from previous policy are identified by the symbol ▼ for easy recognition.

4. Amendments. When required, changes to this publication will be issued as consecutively numbered amendments. A word-processing computer which is being used for this manual provides rapid amendment capability.

5. Action. District commanders, Commander, Activities Europe, and unit commanding officers shall insure that personnel who perform marine safety duties are familiar with the provisions of this volume. In cases of apparent conflict between the provisions of this manual (including subsequent amendments) and any law, rule or regulation, the requirements of law, rule or regulation shall be observed. The Commandant (G-M and/or G-W as applicable) shall be informed of the conflict. In cases of apparent conflict between this manual and conventional practice, the appropriate Headquarters division should be contacted for resolution of any doubt. In either case, appropriate action will be taken by the Commandant to modify any conflicting manual provision.

H. G. [illegible]
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INSTRUCTIONS

Think out your suggestion thoroughly and describe it fully. Give careful consideration to whether your suggestion has local, Coast Guard-wide or broad marine safety application. You may wish to discuss your suggestion with appropriate supervisors and other personnel.

FROM: *(Unit Name and Address)*	NATURE OF SUGGESTION ☐ ADDITION ☐ CORRECTION ☐ DELETION ☐ OTHER *(Specify)*

SUGGESTION: Explain your proposal in sufficient detail so reviewing officers will know exactly what you are proposing. Specify if your proposal has local, Coast Guard-wide or broad marine safety application. Cite the specific section(s) of the manual you are commenting on and specify the benefits of your suggestion. *(If more space is needed, continue on extra sheet).*

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CHAPTER 30 - COMMERCIAL VESSEL SAFETY INSPECTIONS

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PART 30-1—CVS INSPECTIONS—GENERAL

30-1-1. PURPOSE

This chapter contains information and instructions intended to promote a correct and uniform application of the laws and regulations as they relate to vessel inspection and certification.

30-1-5. APPLICATION

These instructions shall be used by all Coast Guard marine safety personnel in determining inspection procedures and requirements for vessels or groups of vessels. For this purpose, however, they must be used in conjunction with other applicable instructions and informational publications such as Law Bulletins, Commandant Instructions, Navigation and Vessel Inspection Circulars, and Commandant Notices. In addition, they may be supplemented, altered, or waived in specific cases by instructions from the Commandant or supplemented by instructions from the district commander or OCMI.

30-1-10. RESPONSIBILITY FOR THE INSPECTION OF VESSELS

30-1-10A. DELEGATION OF AUTHORITY

The Secretary of Transportation has delegated authority to the Commandant to make provisions for his subordinates in the Coast Guard to perform the functions required by certain navigation and vessel inspection laws. The Commandant has accomplished this by issuing regulations published in titles 33, 46, and 49 of the Code of Federal Regulations, and by administrative instructions.

30-1-10B. DIRECT RESPONSIBILITY OF OCMI

Regulations in 33 CFR 1.01-20 provide that the OCMI has the final authority and responsibility for carrying out vessel inspection functions within his zone. He is assigned inspectors to assist him and his decision(s) may be appealed, by the affected party, as described in 46 CFR 2.01-70.

The flow of functional authority from the OCMI to his subordinates and from the Commandant to the OCMI is described in 46 CFR 1.01 and 1.05.

A complete description of the duties and responsibilities of the OCMI and other inspection personnel, such as the chief of the inspection department and the marine inspector, is presented in chapter 2 of this manual.

30-1-15. VESSEL INSPECTION POLICY

Vessel inspection policy is developed to ensure the uniform and consistent administration and enforcement of Federal laws and regulations which are designed for the purpose of protecting U.S. citizens, their private property, and their marine environment from the consequences of incidents involving materially unsafe vessels. Inspection is the process of examining a vessel while it is not engaged in navigation for determining the vessel's reasonably probable compliance with published minimum safety standards over the course of a projected period of time. The issuance of a Certificate of Inspection attests to that reasonable probability. Other examinations may also be made while the vessel is in operation; these other examinations are not "inspections" but may result in withdrawal of Certificates of Inspection, the issuance of Amendments or requirements against Certificates of Inspection, charges against operating personnel under the suspension and revocation proceedings, and/or a "citation" of a civil penalty against the vessel's owner and/or operator.

The Merchant Marine Act of 1936 (46 U.S.C. 1101 *et seq.*), as amended by the Merchant Marine Act of 1970, states that it is the national policy to foster the development and encourage the maintenance of a merchant marine. The agency charged with implementing this policy is the Maritime Administration (MARAD).

It is the aim of the Coast Guard to administer vessel inspection laws and regulatons in such a manner as to promote and obtain safe, well-equipped vessels that are suitable for their intended service without placing an unnecessary burden upon the economic and operational needs of the marine industry. Thus, in determining inspection requirements and procedures, inspection personnel shall keep this thought in mind. Inspection personnel shall also recognize and give due consideration to the following:

- The burden for proposing acceptable repairs rests upon the vessel's owner, not upon the repair facility or the inspector.

- Delays to vessels are costly and the need for a delay must be balanced against the risks imposed by the vessel.

- Certain types of constructions, equipment, and/or repairs are more economically advantageous to the vessel operator and can provide the same measure of safety.

- Some repairs can be safely delayed and can be more economically accomplished at a place and time proposed by the vessel operator.

- The overall safety of a vessel and its operating conditions such as route, hours of operations, type of operation, etc., should be considered in determining inspection requirements, and

- Vessels are sometimes subject to operational safety requirements of organizations and agencies other than the Coast Guard.

A balance shall be maintained between the requirements of safety and needs for practical operations. Arbitrary decisions or actions which do not contribute to the vessel's safety and which tend to discourage the construction or operation of vessels must be avoided. The Commandant requires all inspection personnel to use good judgment and discretion in order to provide a sound and reasonable application of vessel inspection laws and regulations.

PART 30-2—ADMINISTRATION OF CVS INSPECTION

30-2-1. ASSIGNMENT OF MARINE INSPECTORS

The OCMI shall determine the number and technical qualifications of inspectors which are necessary to conduct an adequate inspection or examination on a particular vessel. One inspector (either deck or engineering) is usually sufficient to inspect small vessels such as tank barges, seagoing barges, or small passenger vessels. Larger vessels, or those requiring an accelerated inspection, will normally require two inspectors (deck and engineering) and perhaps additional inspectors if the need arises.

It is important to note that inspectors are considered as either deck or engineering inspectors. However, the OCMI shall insure that all inspectors are cross-trained, within the limits of their capabilities, to serve in both capacities. Thus, an engineering inspector will normally be expected to be capable of making examinations such as the checking of repairs to a lifeboat; a deck inspector will likewise be expected to be capable of making engineering examinations such as the checking of a fire pump.

30-2-5. VESSEL INSPECTION REGULATIONS

Vessel inspection standards are applied and enforced by titles 33, 46, and 49 of the Code of Federal Regulations. In the enforcement of these regulations, care must be taken to insure that each regulation being applied is applicable to the vessel and situation under consideration. The OCMI shall maintain current copies of all rules and regulations affecting vessel inspections, for the information of the public and for use by inspection personnel in accordance with CG-236, *Directives, Publications and Reports Index*. Personal copies of regulations used by inspection personnel shall also be up to date. (In this regard it should be noted that regulation changes are not retroactive unless made so by the text of the regulation.)

In the application of regulations, situations will arise, especially with regard to new procedures and new products, in which the regulations *seem* to apply but are not in the best interests of overall safety, or may not be applicable at all. Inspectors shall be alert to note such situations and shall seek advice from their department head and OCMI before requiring changes which are considered to be improper or unnecessary. Likewise, the OCMI, when in doubt, shall ask advice from the district commander or the Commandant via the chain of command. This situation is to be distinguished from those cases in which the regulations actually do apply, but shouldn't.

30-2-10. INSPECTION DEFICIENCIES

30-2-10A. DEFINITION OF DEFICIENCY

A deficiency means any failure to meet any of the minimum requirements of the vessel inspection laws or regulations. The condition of material or equipment is considered deficient if it:

(1) is presently unsatisfactory to the inspector,

(2) has a reasonable possibility of becoming unsatisfactory prior to the next inspection for certification, or

(3) in the case of items which can only be examined in drydock, has a reasonable possibility of becoming unsatisfactory prior to the next required drydock examination.

30-2-10B. NOTICE OF DEFICIENCY

If, during the course of any inspection or examination of a vessel, the vessel or its equipment is found not to comply with the requirements of vessel inspection laws or regulations or is deficient as to condition, the inspector shall point out all deficiencies and shall discuss all requirements with the vessel's owner or his representative. When necessary, the inspector shall explain that failure to fulfill the requirements before completion of the inspection or examination may result in a refusal to issue or the withdrawal of the vessel's Certificate of Inspection. The owner or his representative shall also be advised that he may discuss, with the OCMI, any deficiency that is not expected to be corrected by the completion of the inspection or examination, so that the OCMI may decide if he wants to permit the deficiency to remain outstanding. Deferment of minor deficiencies may be settled by discussions between the owner or his representative and the inspector when authorized by the OCMI. If the owner or his representative desires further clarification or reconsideration of any requirement, he should consult the OCMI.

When deficiencies are found, the master of the vessel under inspection must be notified (see 46 U.S.C. 435 and 46 CFR 2.01–10). The master (or person serving as master) and any other officer(s) having a primary interest in the inspection, such as the chief mate or chief engineer, shall be kept fully informed of all deficiencies found and requirements issued, even though a port engineer or other owner's representative may be directly concerned with the correction of the deficiencies. Notification of the deficiency by the inspector may be given either verbally or in writing, as circumstances dictate (see 30–2–10C). His written notification to correct a deficiency shall normally be on form CG-835 (Notice of Merchant Marine Inspection Requirements). The original copy of form CG-835 shall be issued to the vessel's master (when issued by the hull inspector) or to the chief engineer (when issued by the boiler inspector) if these persons are available. In their absence the form shall be issued to the officer or other person acting in place of the master or chief engineer. Where there is no member of the crew acting as master or chief engineer, the original copy of form CG-835 shall be issued to the person representing the owner during inspection, and the person's capacity with respect to the vessel (title, etc.,) shall be noted on form CG-835.

It is important that the owner or his representative be informed of the deficiencies found as soon as possible after the inspection or examination has begun. In the case of spaces which are inaccessible but must be inspected, it is within the prerogative of the inspector to issue form CG-835 requiring the rendering of such spaces accessible. Failure to do so promptly may delay the completion of the inspection or examination.

At the completion of each inspection when the vessel is permitted to depart with outstanding deficiencies, the inspector shall make a brief entry upon the Vessel Inspection Record, form CG-2832, indicating the inspection requirements issued. The entry shall be made in accordance with the instuctions on the form. On subsequent visits, inspectors shall determine the status of any outstanding requirements as noted on the Vessel Inspection Record. If copies of such requirements are not on board, the issuing office should be contacted. When deficiencies are satisfactorily completed, the witnessing inspector shall note completion of the items, with the port, date, and his signature on the Vessel Inspection Record, and the issuing office shall be so advised.

30–2–10C. WHEN TO ISSUE FORM CG-835

Form CG-835 shall be issued to cover outstanding deficiencies in each of the following cases:

(1) When it is apparent that the correction of a deficiency may be subject to controversy between the ship owner or operator and the Coast Guard.

(2) When it is desirable to make exact requirements a matter of record.

(3) When some deficiencies have not been corrected by the end of the inspection and are permitted to remain outstanding.

(4) When it is anticipated that all deficiencies will not be corrected by the end of the inspection or examination.

(5) When deficiencies have not been corrected before the vessel proceeds to another inspection zone for completion or continuation of an inspection.

(6) When it is anticipated that an inspection will be completed by another inspector.

(7) When the owner's representative requests a written requirement to cover items considered by the inspector to be deficiencies.

(8) When the OCMI determines such action to be expedient.

In all other cases where the deficiencies are not controversial and corrective action is being taken, the inspector may use his discretion in determining whether or not to issue written requirements on form CG-835.

Written requirements on form CG-835 shall not be issued at the request of the owner's representative or the vessel's crew to cover repairs or changes initiated by the owner when such repairs or changes would not have been required by the inspector. However, when such repairs or changes are undertaken, they must be accomplished to the satisfaction of the inspector.

30–2–10D. HOW TO WRITE REQUIREMENTS TO CORRECT DEFICIENCIES

Special care shall be exercised in the writing of requirements to correct deficiencies. The master should be notified in clear and concise language as to the nature of the deficiency and the steps that must be taken to correct it. Unless a particular sequence, system, order of events, or similar condition is dictated by law, regulation, instruction, or established marine practice, the method of correction should be left to the discretion of the owner or his representative, subject to the marine inspector's approval.

Each written requirement should be as nearly complete within itself as practicable. It may also include a completion date if desired by the OCMI. Requirements such as "Bring into compliance with 46 CFR...." should be avoided. A statement of the inspector's authority (law or regulation) is not necessary on form CG-835, unless specifically required by the OCMI. However, when a particular law or regulation contains information which might clarify the terms of the requirements or suggest alternate means of compliance, reference to such sources may be made. It is recognized that many requirements will be written under conditions requiring haste or under other circumstances where reference to authorities is not feasible.

In some inspection zones, standard wording has been adopted for stating the more frequently occurring requirements on form CG-835. This practice has proven advantageous to inspectors and vessel owners and operators and has been of special benefit in the inspection of small passenger vessels. Such procedure is recommended.

30–2–10E. DEFICIENCIES AND REQUIREMENTS IN INSPECTION REPORTS

Every inspection report shall contain a notation of all deficiencies found and requirements issued by the inspector during the inspection or examination. These entries shall be made whether or not a form CG-835 has been issued. In addition, the report shall also contain a note which indicates the corrective action taken or that the deficiency was permitted to remain outstanding.

The deficiencies, requirements, and corrective action shall be noted or referenced on the blank page opposite the item inspected, in the CG-840 series of inspection report booklets. Requirements issued on form CG-835 shall be attached to the inspection report booklet. They need not be restated in the report but shall be referenced by number and date.

▼30–2–10F. DEFICIENCIES PERMITTED TO REMAIN OUTSTANDING

Deficiencies may be permitted to remain outstanding at the completion of an inspection or examination provided that, in the opinion of the OCMI, they will not materially affect the safety of the vessel during the time permitted to remain uncorrected.▼

These deficiencies will normally fall into the following categories:

(1) Minor requirements, such as those for signs or small repairs, which can be readily accomplished by the ship's crew.

(2) Relatively minor items of equipment that are not then available but which have been placed on order.

(3) Repairs that can be safely postponed and accomplished where those interested can most conveniently do them (see 46 U.S.C. 435).

(4) Deficiencies that remain outstanding when a vessel moves from one zone to another to complete an inspection.

(5) Deficiencies that can be more readily corrected when the vessel is in drydock.

(6) Deficiencies on vessels being laid up and placed out of operation.

(7) Deficiencies which are being appealed.

Upon completion of each inspection or examination, or upon receipt of the inspector's report in those cases where a vessel is to complete inspection in another zone, the OCMI shall advise the owner by letter of any outstanding requirements. The letter, listing such outstanding requirements, shall cite the Coast Guard's authority for making such requirements and shall make reference as necessary to specific regulations which may amplify the terms of the requirements. The time permitted to correct each deficiency shall be indicated by date, reference to next drydocking, next inspection for certification, next U.S. port of call, etc. In addition, the owner shall be required to inform the Coast Guard when the deficiency has been corrected.

A copy of the letter listing such requirements shall be filed by the issuing OCMI. Additional copies shall be forwarded to other OCMI's who are likely to have an interest in the vessel while the deficiencies are outstanding. A copy shall always be forwarded to the OCMI who last certificated the vessel, unless the deficiency is reported at an inspection for certification. When indicated, the OCMI shall forward a copy of the requirement letter to another OCMI with a request that he take the necessary steps to see that the deficiencies are corrected within the specified time limits. The OCMI issuing the letter shall be responsible for a final determination that the deficiencies have been corrected and he shall take all necessary steps to gain compliance with the requirements within the specified time. Time limits may be extended for good and sufficient cause by the issuing OCMI, his district commander, or the Commandant.

The time limit on a deficiency shall not normally be extended by another OCMI or district commander unless the action is agreed to by the issuing OCMI. In no case shall a requirement be modified or canceled by an OCMI other than the issuing OCMI except upon the issuing officer's concurrence. The issuing OCMI shall be notified of the correction of a deficiency by the OCMI of the zone in which the correction took place. This notification procedure shall be followed in all cases.

30–2–10G. DEFICIENCIES REPORTED BY CREWMEMBERS

All licensed officers are required, by 46 U.S.C. 234, to assist the inspector in his examination and to point out all known defects and imperfections. Inspectors shall inquire about deficiencies from the master and chief engineer, and shall be receptive to all reports of deficiencies made by the ship's officers and crew. In each case the reported deficiency shall be checked into, and corrective action shall be taken where indicated. A note concerning each complaint of deficiency shall be included in the inspector's report. It is not necessary to list names or ratings in usual cases, but in each case the OCMI shall be fully informed. Inspectors should be aware that 46 U.S.C. 234 contains prohibitions concerning the disclosure of the source of information about deficiencies.

On most vessels there is an active safety committee, generally under company and/or union sponsorship, which meets regularly and considers a wide range of safety matters, almost all of which, in some degree at least and particularly where material items are involved, are of concern to the Coast Guard. It is highly probable that marine inspectors will, from time to time in the course of their duties, be approached by spokesmen of ships' safety committees, either verbally or by written petition, regarding items of varying severity. Whenever such contact is made, the marine inspector must take cognizance of the matters brought to his attention and in every case he shall fully inform the OCMI of the complaint and action taken. Aside from being good administrative procedure, this is necessary because copies of complaints are sometimes sent to various officials, quite often including the Commandant and members of Congress. This may result in a need for the Commandant to contact the OCMI for additional information.

30–2–10H. CONDEMNING EQUIPMENT IN USE

OCMI's shall not condemn or impose additional or different requirements on "approved" equipment or other inspection items that have been passed or accepted by another OCMI, except in the following cases:

(1) When deficiencies exist and were undiscovered due to inspection errors or omissions.

(2) When the item has since been damaged or has otherwise deteriorated to such an extent that it is no longer fit for the service intended.

(3) When the requirements of law or regulation have changed and the change is retroactive.

(4) When the route or service of the vessel is being changed, or alterations are being made to the vessel that make changes necessary for compliance with different regulations.

(5) When directed by the Commandant.

Except in the above-listed cases, when equipment or other inspection items once approved by the Commandant or another OCMI are considered by an OCMI to be unsuitable because of workmanship arrangements or design, both OCMI's should attempt to resolve the matter between themselves. If the problem cannot be resolved, no further action should be taken to require changes until a decision has been rendered by the cognizant district commander(s). When district commanders cannot reach agreement, the matter shall be referred to the Commandant.

30–2–10I. INSPECTION ERRORS OR OMISSIONS

Inspected items that are found to be deficient but which were undiscovered due to inspection errors or omissions at previous inspections, or by previous inspectors at the same inspection, should normally be required to be corrected. Where indicated, reference should be made to previous inspection records, or the inspectors concerned should be contacted to determine the status of the inspection item in question. Care should be taken to insure that the item has not been previously approved or accepted as satisfactory before making additional requirements.

The owner of a vessel shall be given all possible consideration in the correction of inspection items found to be deficient because of inspection errors or omissions. Unless such items are considered to be of major importance to the safety of the vessel, the OCMI shall allow a reasonable amount of time for their correction.

30–2–10J. CHANGE OF INSPECTORS DURING INSPECTION

Changing inspectors during the inspection of a vessel should be avoided, but if a change must be made, there shall be a clear understanding between the inspectors concerning approved items and outstanding deficiencies. Proper use of the CG-840 series of inspection books and form CG-835 will facilitate this understanding. The relieving inspector shall neither change requirements imposed by the first inspector nor impose additional requirements concerning items approved or accepted as satisfactory by the first inspector unless he has received authority from the OCMI or the chief of the inspection department. Normally one or both of them will confer with the first inspector before authorizing a change in requirements or imposing additional requirements with respect to items checked by the second inspector.

30-2-10K. DEFICIENCIES AND REQUIREMENTS BETWEEN INSPECTION ZONES

The OCMI of the zone in which requirements have been imposed shall notify the OCMI of another zone as to any outstanding requirements under the following circumstances:

(1) When inspection has started in one zone and is to be completed or continued in another zone.

(2) When it is probable that a vessel will complete the requirement in another zone.

(3) When the vessel shifts its home port or primary port of operation to another zone.

(4) When the vessel is certificated in another zone.

OCMI's shall insure that deficiencies on vessels operating in their zones are corrected, even though requirements to correct such deficiencies may have been issued in another zone. As provided in section 30-2-10F, OCMI's shall not cancel or otherwise change a requirement to correct a deficiency that has been imposed on a vessel by another OCMI unless such action is agreed to by the issuing OCMI.

Additional or modified requirements shall not normally be imposed on a vessel when it has been approved in one zone and shifts to another zone for a similar operation and route. When there is disagreement between OCMI's as to deficiencies or requirements, the matter shall be referred to the district commander(s) for resolution. When the district commander(s) cannot reach agreement, the matter shall be referred to the Commandant. Unless the situation is extremely hazardous, no modified requirements or additional requirements shall be imposed on the vessel owner before the differences of opinion between the OCMI's are resolved. When an OCMI finds it necessary in the interest of safety to take immediate action to change requirements or impose additional requirements under the above circumstances, he shall notify the first OCMI by letter with copies to the district commander(s) and the Commandant.

When previous inspection records would be of benefit in resolving inspection problems on a vessel that has been previously inspected in another zone, the OCMI of the zone in which the inspection is being conducted should obtain information or records from the OCMI of the zone in which the previous inspection took place. The OCMI who issued the notice of deficiency and the OCMI who last certificated the vessel shall be notified of the correction of a deficiency as provided in paragraph 30-2-10F(7).

30-2-15. SPECIAL CONSIDERATIONS

Throughout the vessel inspection regulations there are specific regulations that permit special actions and considerations to be given to certain circumstances. In many cases the discretion to give special consideration rests with the Commandant or district commander. In some regulations the OCMI is given the authority for this special consideration and he may further delegate the authority to his inspectors. Other regulations specifically authorize the inspector to make discretionary rulings on inspection matters within the limits of office policy.

These special consideration provisions shall be used to provide a practical applicability of the regulations and to avoid unreasonable requirements and arbitrary actions or decisions not necessary to maintain an adequate degree of safety. This policy applies only to those areas of the regulations which are expressly covered by the special provisions. The regulations in 46 CFR 30.15, 70.15, 90.15, 175.15, and 188.15 permit the use of alternate fittings, apparatus, equipment, and arrangements in lieu of those required by the regulations when these alternates are permitted by the Commandant.

The OCMI is permitted by 46 CFR 175.25–1 to give special consideration to departures from the specific requirements of the small passenger vessel regulations when special circumstances or arrangements warrant such departures. The regulatory program under 46 U.S.C. 390b requires a realistic appraisal of the operational necessities of the small passenger vessel industry. In this regard, the Coast Guard must recognize that, in many areas, local practice and experience in meeting the peculiarities of local conditions have proved the possibility of safe operation under conditions that do not conform to the specific provisions of the regulations when arbitrarily applied.

Marine inspectors shall note in their inspection reports all items that have required interpretations of regulations and on which interpretations have been rendered by the OCMI, district commander, or the Commandant. Such items would include equivalents, substitutions, nonapproved equipment, nonstandard fuel tanks, etc. These notes should preclude differing requirements by different inspectors by forming the basis for comparison with installed items at subsequent inspections.

An inspector's decision made in connection with certain marine engineering items requires notation in the inspector's report. The requirement for this notation is in 46 CFR 50.20–35.

30–2–20. MAINTENANCE OF VESSEL INSPECTION RECORDS

30–2–20A. RECORDS REQUIRED

The Coast Guard is required, by 46 U.S.C. 414, to keep adequate inspection records. The OCMI shall require that records of all vessel inspections and of all actions pertaining to vessel inspection (approval or disapproval) be made and maintained as required by this law. Directives and file numbering systems shall be maintained in accordance with the *Coast Guard Directives System* (CG-199–1), Commandant Instruction 5210.5 (series), and Commandant Instruction 5210.6 (series). Inspection records and files in field offices shall be retained, destroyed, retired, or transferred as required by the *Paperwork Management Manual* (CG-416). Records at Headquarters are kept in accordance with the *Headquarters Records Control Manual* (CG-416–1).

30–2–20B. TRANSFER OF RECORDS BETWEEN OCMI'S

The inspection records covering the initial construction and inspection of all vessels, except those inspected under 46 CFR Subchapter T, shall be maintained on a permanent basis by the OCMI conducting the initial inspection, subject to the disposal instructions in CG-416. All current records, except the initial inspection records, shall be transferred to the new zone when a vessel transfers its principal port of operation to a new zone.

All current inspection files for small passenger vessels inspected under Subchapter T, including the files of the initial inspection, shall be held by the OCMI of the zone in which the vessel is currently operating. Files shall be transferred between OCMI's when the vessel's principal area of operation shifts from one zone to another. Any vessel inspection files may be transferred between zones on a temporary basis when such files are needed in connection with a current inspection problem. As noted in section 30–2–10K, OCMI's should obtain records from other zones if such records would be of benefit in resolving inspection problems. When transferring original files between OCMI's, the transferring office should retain adequate file or record copies in the event of mail loss.

30-2-20C. CERTIFIED COPIES OF INSPECTION RECORDS

From time to time, certified copies of inspection records will be needed for use in court proceedings. These certified copies may be made by a photographic copying process, or by copying the record word for word when the record consists of entries on a form and the same type of form is available. The copy requiring certification shall be certified by the OCMI (or by the Acting OCMI) in a manner similar to the following:

> "Certified to be a true copy of the record of inspection covering the inspection of the SS________between 8 and 12 December 1960, which is on file in my office and of which I am the custodian.
>
> John Doe
> Commander, U.S. Coast Guard
> Officer in Charge, Marine Inspection
> Philadelphia, PA."

If practicable, the copy shall be stamped with the Coast Guard seal. (It should be noted that the Coast Guard seal has no legal effect and is authorized only for adornment purposes by a U.S. Department of Transportation (DOT) Order. It has been officially replaced by the DOT seal for all other purposes.)

The certification shall be placed on the front of the record or otherwise attached to it. Certification of each separate page of an inspection report is not necessary. Inspection records requiring certification or validation with the Department of Transportation seal shall first be certified by the OCMI and then forwarded to Commandant (G-L).

Instructions with regard to charges for certification of documents are in 33 CFR 1.25 and 49 CFR 7.91. Instructions concerning the release of investigative records to a court are in part 72-6 of this manual.

30-2-25. PUBLICATIONS

30-2-25A. REQUIRED PUBLICATIONS

Chapter 2 of the *Directives, Publications and Reports Index* (CG-236) contains a listing of the effective required publications for marine safety units. This chapter also contains a listing of effective periodicals. CG-236 contains ordering instructions for both Coast Guard and non-Coast Guard publications and a table of distribution symbols for each publication taken from the *Standard Distribution List* (CG-131). This is to assist each unit in determining which publications are required to be maintained. CG-236 is updated and republished semiannually by the Commandant.

30-2-25B. RECOMMENDED REFERENCES

In addition to the publications listed in CG-236, OCMI's shall obtain and make available to inspection personnel such publications as he deems necessary for the reference and proper training of personnel. Sufficient numbers and varieties of these publications shall be obtained to keep inspection personnel abreast of modern developments in ship operations, construction, repair, etc. The following publications are considered to be good as reference material and for use in the training of inspection personnel. They are in addition to the effective periodicals listed in CG-236. This list is only a suggested one and may be modified to suit the needs of an individual office:

1. *A Guide to the Non-Destructive Testing of Non-Butt Welds in Commercial Ships, Parts I and II*, Ship Structure Committee(SSC).

2. *A Guide to Sound Ship Structures*, D'Archangelo.

3. *American National Standards Institute (ANSI) Steel Pipe Flanges and Flanged Fittings, ANSI B 16.5*, American Society for Testing and Materials (ASTM).

4. *ANSI Standard for Steel Valves, ANSI B 16.34*, ASTM.

5. *ANSI Standards for Power Piping, ANSI B 31.1*, ASTM.

6. *Approved Welding Electrodes, Wire-Flux and Wire Gas Combinations*, American Bureau of Shipping (ABS).

7. *ASME Boiler and Pressure Vessel Code*, The American Society of Mechanical Engineers (ASME).

8. *Boilerworker First and Chief-NAVPERS 10537*, U.S. Navy.

9. *Carbon Dioxide Extinguishing Systems-NFPA 12*, National Fire Protection Association (NFPA).

10. *Care of Fire Hose-NFPA 198*, NFPA.

11. *Considerations for the Prevention of Furnace Explosions and Superheater Damage in Merchant Ship Boilers During Light-Offs-T & R R-23*, SNAME

12. *Control of Gas Hazards on Vessels to be Repaired-NFPA 306*, NFPA.

13. *Dangerous Properties of Industrial Materials*, Sax.

14. *Defects and Failures in Pressure Vessels and Piping*, Helmut Thielsch (Reinhold Publishing Corp., New York).

15. *Dry Chemical Extinguishing Systems-NFPA 17*, NFPA.

16. *Engineering Materials Handbook*, Mantell (McGraw-Hill Book Co., New York).

17. *Fiberglass Boat Design and Construction*, Scott and DeGraff.

18. *Fiberglass Boats*, Du Plessis and De Graff.

19. *Fire Hose Coupling Screw Threads-NFPA 194*, NFPA.

20. *Fire Protection of Vessels during Construction, Repair and Lay-up-NFPA 312*, NFPA.

21. *Fire Protection Standards for Motor Craft-NFPA 302*, NFPA.

22. *Flammable Liquids Code-NFPA 30*, NFPA.

23. *Flash Point Index of Trade Name Liquids-NFPA 325A*, NFPA.

24. *Foam Extinguishing Systems-NFPA 11*, NFPA.

25. *General Information for Grain Loading*, International Cargo Gear Bureau, Inc.

26. *Guide for Construction of Shipboard Elevators*, ABS.

27. *Guide for Inert Gas Installations on Vessels Carrying Oil in Bulk*, ABS.

28. *Guide for Repair, Welding, Cladding and Straightening of Tail Shafts*, ABS.

29. *Guide for Centralized Control and Automation of Ship's Steam Propulsion Plant-T & R 3–23*, SNAME.

30. *Guide for Shipboard Centralized Control and Automation*, ABS.

31. *Guide for Underwater Inspection in Lieu of Drydocking Survey*, ABS.

32. *Halon 1301-NFPA 12A*, NFPA.

33. *Handbook of Ship Calculations, Construction and Operation*, Hughes.

34. *Handbook of Test Methods and Practices-NAVSHIPS 918828,* U.S. Navy.

35. *Handbook of Wooden Boat Construction,* Chapelle.

36. *Handbook on Sanitation of Vessel Construction-PHS No. 393,* U.S. Public Health Service (USPHS).

37. *Handbook on Sanitation of Vessels in Operation-PHS No. 68,* USPHS.

38. *Inspection Manual,* NFPA.

39. *International Oil Tanker and Terminal Safety Guide,* International Oil Tanker Terminal Safety Group (IOTTSG).

40. *Introduction to Steel Shipbuilding,* Baker.

41. *Manual of Safe Practices in Offshore Operations,* Offshore Operations Committee.

42. *Marine Chemists Directory* (current year), NFPA.

43. *Marine Design Manual for Fiberglass Reinforced Plastics,* (Mc Graw-Hill).

44. *Marine Engineering,* Harrington (The Society of Naval Architects and Marine Engineers (SNAME, 1971).

45. *Marine Engineers Handbook, Lamberton and Marks.*

46. *Merchant Ships,* John M. LaDage (The Cornell Maritime Press).

47. *National Electrical Code-NFPA 70,* NFPA.

48. *National Electrical Safety Code-Handbook H 30,* National Bureau of Standards, U.S. Department of Commerce.

49. *Nondestructive Testing Handbook,* 2 Vols. R.C. McMaster, ed. (The Society for Nondestructive Testing: The Roland Press).

50. *Portable Fire Exinguishers-NFPA 10,* NFPA.

51. *Principles of Magnetic Particle Testing,* Betz.

52. *Principles of Naval Architecture,* SNAME, 1967.

53. *Principles of Penetrants,* Betz.

54. *Provisional Rules for the Approval of Filler Metals for Welding Higher Strength Steels,* ABS.

55. *Radiographs of Welds,* International Institute of Welding (IIW).

56. *Recommended Practice for Electrical Installations on Shipboard-IEEE Standard No. 45,* Institute of Electrical and Electronic Engineers (IEEE).

57. *Requirements for Radiographic Inspection of Hull Welds,* ABS.

58. *Requirements for the Certification of the Construction and Survey of Cargo Gear on Merchant Vessels,* ABS.

59. *Requirements for the Certification of the Construction and Survey of Self-Unloading Cargo Gear on Great Lakes Vessels,* ABS.

60. *Rules and Regulations for the Construction and Classification of Steel Yachts,* Lloyds Register of Shipping.

61. *Rules and Regulations for the Construction and Classification of Wood and Composite Yachts,* Lloyds Register of Shipping.

62. *Rules for Building and Classing Aluminum Ships,* ABS.

63. *Rules for Building and Classing Bulk Carriers for Service on the Great Lakes*, ABS.

64. *Rules for Building and Classing Offshore Mobile Drilling Units*, ABS.

65. *Rules for Building and Classing Steel Barges for Offshore Service*, ABS.

66. *Rules for Building and Classing Steel Vessels*, ABS.

67. *Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways*, ABS.

68. *Rules for Building and Classing Steel Vessels Under 61 Meters*, ABS.

69. *Rules for Building Wooden Hulls*, ABS.

70. *Rules for Nondestructive Inspection of Hull Welds*, ABS.

71. *Safety and Health in Dock Work-Code of Practice*, The International Labor Organization (ILO).

72. *Safety Code for Elevators, Dumbwaiters and Escalators*, The American National Standards Institute, Inc. (ANSI).

73. *Safety Manual for Marine Oil-Fired Watertube Boilers*, The National Safety Council.

74. *Ship Design and Construction*, SNAME, 1969.

75. *Specifications by the American Society for Testing and Materials, (All Parts)*, ASTM.

76. *Standard Marking System for Valves, Fittings, Flanges and Unions-MSS-SP 25*, The Manufacturers Standardization Society (MSS).

77. *Standards for the Installation of Sprinkler Systems-NFPA 13*, NFPA.

78. *Standards for Marine Type Electric Lighting FixturesSubject 595*, Underwriter's Laboratories, Inc. (UL).

79. "Standards of the American Boat and Yacht Council, Inc." (ABYC).

80. "Standards of the American Welding Society" (AWS).

81. "Standards of the Compressed Gas Association" (CGA).

82. "Standards of the Marine Department, Underwriters' Laboratories, Inc." (UL).

83. "Standards of the Tubular Exchanger Manufacturer's Association" (TEMA).

84. *Static Electricity-NFPA 77*, NFPA.

85. *Steel Construction Manual*, The American Institute of Steel Construction.

86. *Tanker Handbook for Deck Officers*, C. Baptist.

87. *Storage and Handling of Liquefied Petroleum Gases – NFPA-58*, NFPA.

88. Various handbooks published by aluminum manufacturers.

89. Various maintenance manuals published by the manufacturers of boilers, turbines, etc.

90. *Welding Handbook*, Sections 1–5 (latest editions), The American Welding Society (AWS).

91. *Wire Rope and Strand (Federal Specification RR-W410C)*.

92. *X-ray Standards for Production and Repair Welds-NAVSHIPS 250–692–2*, U.S. Navy.

PART 30-3—CVS INSPECTION—PLANS AND SPECIFICATIONS

30-3-1. GENERAL

The instructions in this part are intended to promote uniformity in the submission and review of plans for the construction, alteration, and repair of inspected vessels.

30-3-5. BACKGROUND AND AUTHORITY

30-3-5A. LAWS

46 U.S.C. 369 provides for a Coast Guard technical staff and requires the staff to approve or disapprove contract plans and specifications for construction or material alteration of passenger vessels of the United States of 100 gross tons and over propelled by machinery. It also provides for the acceptance of American Bureau of Shipping plans for classed vessels as evidence of the structural efficiency of the hull and reliablility of the machinery except where existing law places definite responsibility on the Coast Guard. This law also provides that construction or alterations shall not be undertaken before plans and specifications have been approved, and it provides for a withholding of the Certificate of Inspection from a vessel which does not conform in all material respects to the approved plans and specifications.

In addition to the requirements for plans and specifications in 46 U.S.C. 369, other vessel inspection laws provide for the promulgation of regulations with respect to the design, construction, alteration, or repair of vessels. Under these inspection laws, regulations have been established which require approval of plans and specifications prior to the construction or material alteration of any vessel required to be inspected.

30-3-5B. PLAN APPROVAL REGULATIONS

The following sections of chapter 1 of title 46 CFR contain the requirements and procedures for the submission of plans and specifications for the inspected vessels indicated:

Type of Vessel	New Construction	Repairs or Alterations	Stability Plans
Tank vessels	31.10-5	31.01-20 31.10-25	31.10-30
Passenger vessels	71.65	71.55 71.65-10	74.05-5
Cargo & Misc. vessels	91.55-5	91.45 91.55-10	93.05-5
Nautical Schools	167.15-15	167.30	167.20-25
Small passenger vessels	177.05	176.20	177.05-3
Oceanographic vessels	189.55	189.45-1	191.15-5
Mobile Offshore Drilling units		(proposed rules)	

Repairs or alterations affecting machinery may require submission of plans or specifications in accordance with 46 CFR 31.10-25, 71.55-1, 91.45-1, 167.65-70, 176.20-1, or 189.45.

Plans and specifications covering boilers, pressure vessels, piping, and equipment to be installed on vessels subject to inspection by Coast Guard are required by 46 CFR 50.20, 52.01-5, 53.15, 54.01-18, 55.05, 56.01-10, 58.25-15, 63.10-5, 63.15-5, and 64.7.

Plans and specifications covering certain electrical items and pieces of machinery on vessels subject to Coast Guard inspection in conjunction with new construction, alteration, and repair are required by 46 CFR 111.05-5.

30-3-10. SUBMISSION PROCEDURES

30-3-10A. GENERAL

The various regulations in title 46 CFR chapter I (Shipping) describe procedures for the submission of plans and specifications. In general, procedures described in this subpart of the manual would apply, but in any specific case a more expeditious procedure may be used. The general requirements for plans, drawings, or blueprints are found in 46 CFR 2.90-1.

30-3-10B. SPECIFIC PROCEDURES

The required plans and specifications may be submitted to the OCMI having jurisdiction. This is the most expeditious procedure for those offices where personnel are available for local examination and approval. When plans are approved by the OCMI, one copy should be returned to the originator, and one copy should be forwarded to the district commander (mmt) serving the areas indicated below. A copy of the approval letter should accompany the plans. When personnel are not available to approve plans at the MSO or MIO, plans must be forwarded to Commandant (G-MMT) or to one of the district commanders (mmt) for approval. The OCMI shall examine the plans for the presence of all items that he considers warranting special attention before forwarding the plans. Plans for boilers shall be submitted to Commandant (G-MMT).

The OCMI's in the following geographic areas shall forward plans to the following district commanders:

- 1st & 3rd Districts to CCGD3(mmt);
- 5th District to CCGD5(mmt);
- 2nd, 7th, and 8th Districts to CCGD8(mmt);
- 9th District to CCGD9(mmt); and
- 11th, 12th, 13th, 14th, and 17th Districts to CCGD12(mmt).

When pressure vessel plans are approved by the OCMI, one copy shall be returned to the originator and one copy retained for file. A copy of pressure vessel plans approved by Commandant (G-MMT) and the district commanders (mmt) shall be returned to the originator and one copy forwarded to the OCMI having jurisdiction over the fabrication. In each instance only two copies are required, one for the originator and the other for the file which is to be retained at the OCMI level for a period of time specified by the *Paperwork Management Manual* (CG-416). Any modifications to approved pressure vessel plans submitted for review to either the district commander (mmt) or Commandant (G-MMT) must be accompanied by a set of the original drawings provided either by the fabricator or the OCMI. Commandant (G-MMT) will not retain copies of pressure vessel plans. If a determination is made that plans do not comply with the applicable requirements, then the manufacturer shall be advised of the reasons for disapproval.

Proposals are frequently received by the district commander (mmt) prior to the selection of the repair or construction site. Prospective OCMI plan and correspondence files are established and are forwarded to the OCMI *if* the technical office is made aware of where the work is to be accomplished. OCMI's are encouraged to communicate with Commandant (G-MMT) or the district commander (mmt), as appropriate, when requests are received for inspection of new construction, major repairs, or conversions for which approved plans and related correspondence are not held.

Plans which require Coast Guard approval may be submitted directly to the appropriate district commander (mmt) or to Commandant (G-MMT). Whenever this is done, one set of the approved plans will be returned directly to the originator and one set will be forwarded to the OCMI having jurisdiction over the vessel. In view of his proximity to, and personal knowledge of the vessel, an OCMI, when taking action on approved plans, may determine that certain items are not in compliance with applicable regulations or that certain items do not provide the degree of safety required. In these cases, the cognizant district commander (mmt) shall be notified promptly of any items that the OCMI considers as requiring reconsideration.

In the case of classed vessels, upon specific request by the originator, the American Bureau of Shipping will arrange to forward the necessary plans to Commandant (G-MMT) or district commander (mmt) after indicating ABS action thereon. In this case, three copies of each plan, in addition to the number required by the American Bureau of Shipping, should be submitted to the Bureau. When the plans are received and approved by Commandant (G-MMT) or the district commander (mmt), one set will be returned directly to the builder, owner, or designer, and a copy will be sent to the OCMI having jurisdiction over the vessel.

In order that the adminstration of the requirements of 46 CFR Parts 110–113 (Subchapter J—Electrical Engineering) may be uniform to avoid the pitfalls of misinterpretation, it is considered advisable that certain basic plans of electrical installations, when submitted to the OCMI, should be acted upon only by the applicable district commamder (mmt). Following examination thereof, the plans with an action letter shall be returned to the cognizant OCMI. Therefore, when electrical plans are submitted to the OCMI, the following procedures shall be followed:

(1) Initial copies of the following plans required for submission by 46 CFR 111.05–5 shall be forwarded to the cognizant district commander (mmt) for action:

- Specifications
- General arrangements
- Switchboard front, rear, end, and section views
- Switchboard wiring diagram
- Switchboard material and nameplate list
- Elementary wiring diagram of metering and automatic switchgear
- Description of operation of propulsion control and bus transfer switchgear
- Elementary wiring diagram of power system
- Electric plant summary showing connected loads and calculated operating loads for various conditions of operation
- Elementary wiring diagram of steering gear alarm circuits and ventilation shut-down control
- Elementary wiring diagram and isometric or deck wiring diagrams of electric watertight door system and power-operated lifeboat winches

(2) Other plans listed in 46 CFR 111.05–5 not listed above may be acted upon directly by the OCMI, or they may be transmitted to Commandant (G-MMT) or the applicable district commander (mmt) for action.

(3) Subsequent submittals which incorporate revisions of the plans listed in (1) above may be acted upon directly by the OCMI or they may be transmitted to Commandant (G-MMT) or district commander (mmt) for action. When major changes or revisions are made on these plans they must be forwarded to the applicable technical office for action.

Plans for cargo gear which have been reviewed and approved by the American Bureau of Shipping or the International Cargo Gear Bureau need not be submitted for further approval.

30–3–10C. IDENTIFYING PLANS AND SPECIFICATIONS

Whenever plans of inspected vessels are submitted to the Commandant, such plans shall be identified by vessel name and official number whenever known. In the case of a new vessel, designation by shipyard work order number or hull number may be used until the vessel's name becomes known; then the vessel's name shall *also* be given. In the case of the conversion of an existing vessel, the new name shall be given whenever known, as well as the former name or type designation. Tank vessel plans shall be accompanied with information concerning the grades of liquid cargo the vessel will carry and its proposed service. Tank barges shall also be designated as manned or unmanned.

30-3-10D. SEQUENCE OF SUBMITTAL

To permit the proper evaluation of the construction plans for a vessel, it is essential that the following basic plans for *all* vessels, except 46 CFR Subchapter T-Small Passenger Vessels (under 100 GT), be forwarded for approval *prior* to the submittal of the other plans listed in 46 CFR 71.65-5 and 91.55-5:

- Specifications (hull, machinery, and electrical).
- General arrangement plans.
- Midship section.
- Lines.
- Curves of form.
- Calculation of intact stability.
- Capacity plan.
- One-line wiring diagram of electrical system.

In the case of passenger vessels, except 46 CFR Subchapter T vessels, the following plans shall also be submitted in addition to the basic plans above:

- Floodable length curves.
- Calculations of stability in intact and final flooding conditions.
- Fire control plan.

30-3-10E. IDENTICAL TANK BARGES

A proposed barge is sometimes identical in structure and piping to a previously approved barge. In order to avoid duplication in the approval of plans, and the unnecessary submission of plans, the following procedures shall be followed:

(1) For any proposed barge, only the general design, hull structure, electrical, and piping plans need be submitted to the applicable technical office (Commandant (G-MMT) or district commander (mmt)) for approval.

(2) When a barge is identical in construction to a previously approved barge, it is not necessary to submit plans to the applicable technical office. Extension of the existing approval can be given to the new barge by letter from the cognizant OCMI. The applicable technical office should be informed of the new barge hull and contract numbers so that the records of that office can be kept current.

(3) The details of construction of any barge, such as connections or deck fittings which do not involve the structure of the vessel, need not be submitted to the applicable technical office for action, but can be approved by the OCMI.

(4) When construction previously approved is changed by a significant alteration, the plans referred to in paragraph (1) above shall be resubmitted to the applicable technical office for consideration. The significance of the alteration can best be judged by the OCMI on the merits of the particular case.

30-3-15. APPROVAL PROCEDURES

30-3-15A. PASSENGER VESSELS

The rules promulgated by the American Bureau of Shipping and designated "Rules for Building and Classing Steel Vessels" will, in general, be accepted as standard in reviewing the plans and specifications for the construction, alteration, or repair of passenger vessels. The remaining requirements for these plans are contained in 46 CFR Parts 70-80 (Subchapter H-Passenger Vessels). These standards are suitable for the typical passenger vessel. In reviewing plans for a vessel of unusual form, arrangement, or construction, the same degree of safety must be maintained as is established in these standards. When plans approved by the American Bureau of Shipping are received, they will, in general, be accepted as satisfactory, except insofar as the law or regulations contain requirements which are not covered by the rules of the American Bureau of Shipping.

The approved structural insulation, bulkhead panels, and deck coverings may be used to achieve various structural fire protecion classifications for steel bulkheads and decks required by 46 CFR 72.05. To provide information for shipbuilders and others concerned, a Navigation and Vessel Inspection Circular (NVC 10–63) has been distributed. The sketches accompanying this Circular show diagrammatically the type, thickness, and relative positions of materials necessary to meet class A-60, A-30, or A-15 requirements. Class A-0 construction is not included. No insulation is required on structural steel bulkheads or decks to meet Class A-0 requirements. Since it is obviously impossible to anticipate all of the combinations of materials which might be used, approval will be given to arrangements differing from these sketches if equivalent integrity and heat transmission qualities are provided. The approved insulation, bulkhead panels, and incombustible materials are listed in the *Equipment Lists* (CG-190). Current changes are published in the Federal Register and the Federal Register Reprint Series.

30–3–15B. CARGO AND MISCELLANEOUS VESSELS

The rules promulgated by the American Bureau of Shipping and designated "Rules for Building and Classing Steel Vessels" will, in general, be accepted as standard in reviewing the plans and specifications for the construction, alteration, or repair of cargo and miscellaneous vessels. The rules promulgated by the American Bureau of Shipping and designated "Rules for Building and Classing Offshore Mobile Drilling Units" will, in general, be accepted as standard in reviewing the plans and specifications for construction, alteration, or repair of mobile offshore drilling units. The remaining requirements for these plans are contained in 46 CFR Parts 90–105 (Subchapter I—Cargo and Miscellaneous Vessels). These standards are suitable for the typical vessel. However, when reviewing plans for a vessel of unusual form, arrangement, or construction, the same degree of safety must be maintained as is established in these standards. When plans approved by the American Bureau of Shipping are received, they will, in general, be accepted as satisfactory except insofar as the laws or regulations contain requirements which are not covered by the rules of the American Bureau of Shipping.

30–3–15C. TANK VESSELS

30–3–15C(1). Plan Approval. The rules promulgated by the American Bureau of Shipping (ABS) and designated "Rules for Building and Classing Steel Vessels" will, in general, be accepted as standard in reviewing the plans and specifications for the construction, alteration, or repair of tank ships. In the same manner, ABS has published three other sets of rules which are accepted as standard for the determination of scantlings for tank barges. They are: "Rules for Building and Classing Steel Vessels for Service on Rivers and Intercoastal Waterways"; "Rules for Building and Classing Steel Barges for Offshore Service"; and, "Rules for Building and Classing Aluminum Vessels". The remaining requirements for these plans are contained in 46 CFR Parts 30–40 (Subchapter D—Tank Vessels). These standards are suitable for the typical tank vessel. In reviewing plans for a vessel of unusual form, arrangement, or construction, the same degree of safety must be maintained as is established in these standards. When plans approved by the American Bureau of Shipping are received, they will, in general, be accepted as satisfactory, except insofar as the laws, regulations, or instructions contain requirements which are not covered by the rules of the American Bureau of Shipping.

30–3–15C(2). Construction Details Affecting Cleaning and Gas-Freeing of Cargo Tanks. In reviewing the structural plans of tank vessels, particular care must be taken to avoid any arrangement of the structural members that would prevent effective cleaning or gas-freeing of a liquid cargo tank. Adequate provisions should be made for drainage in all longtitudinal and transverse members within a tank. Any arrangement of longitudinals, stiffeners, skegs, bilge keels, fenders, or other members, which results in the creation of a possible gas pocket either in the cargo tanks or in contiguous areas to these tanks must not be approved.

30-3-15D. BOILERS AND PRESSURE VESSELS

30-3-15D(1). Design Checks by Computations. The regulations in 46 CFR Parts 52-54 (Subchapter F—Marine Engineering) adopt and amend the ASME design formulas for boilers and pressure vessels (as covered in Section I, Section IV, and Division I of Section VIII of the ASME Code) for use by the Coast Guard in checking the design of each component pressure part of boilers or pressure vessels. The changes, with the minor modifications, clarify Coast Guard requirements, eliminate duplications, and establish standards familiar to industry. Those requirements peculiar to marine installations and necessary for testing and inspection remain unchanged.

When drawings of a pressure vessel are approved by the OCMI, the design of each component pressure part of the pressure vessel shall be checked. The formulas to be used are provided in the various sections of 46 CFR Parts 50-64, and the computations shall be filed with the drawings. The maximum allowable stress of the material at the design temperature shall be used in making the calculations.

The OCMI shall determine if the design of a pressure vessel conforms to all the requirements of 46 CFR Parts 50-64. The design should not result in stresses exceeding those permitted for the type of construction and materials proposed. The manholes or other openings should be adequate and these openings should be so located as to permit easy access for inspection and cleaning. The interior construction should be such that it does not obstruct the openings and defeat their purposes. Each part should have the strength required for safe operation at the maximum allowable working pressure.

In interpreting the regulations regarding heads for marine boilers, it is important to distinguish between dished heads used in marine boilers, which are flanged to a knuckle radius of three times the thickness of the material, and the ellipsoidal or semi-elliptical heads, which are flanged to a radius greatly in excess of that required for spherically dished heads.

Any dished head is most likely to fail at the point at which it is flanged to meet the shell. The shorter the knuckle radius where the head is dished, the greater the tendency to crack at that point, which, together with the possibility of residual stresses set up the metal due to flanging, makes this particular point the weakest part of any dished head. Dished heads are, in general, formed (1) to the segment of a sphere and flanged to meet the shell or (2) to a hemispherical section with the radius of the hemisphere equal or nearly equal to the radius of the shell or (3) to an elliptical section with the depth of the head at least equal to one-fourth of the inside diameter of the head and flanged to meet the shell. Hemispherically dished heads eliminate knuckle radius since the radius of curvature is equal or nearly equal to that of the shell to which it is to be secured. A head of an ellipsoidal form is a compromise between a hemispherical head, which takes up considerable space but which has the advantage of being an attachment to the shell with no knuckle, and a torispherical head, which takes up the least space of the three but which has the disadvantage of a stress raiser at its comparatively sharp knuckle. Refer to the drawings in Section VIII of the ASME Code.

Stresses due to hydrostatic head, and any additional stresses imposed by effects other than internal pressure, must be taken into account in determining the minimum thickness of the shell or head of a pressure vessel designed with a factor of safety of four.

30-3-15D(2). Requests for Increase in Boiler Pressure. A request for an increase in the maximum allowable pressure of a boiler, or a request for approval of new boilers intended to replace existing boilers and designed to operate at pressures in excess of the pressure currently allowed by the Certificate of Inspection, must be accompanied by drawings and substantiating data, and shall be submitted to Commandant (G-MMT) for approval.

30-3-15D(3). Boilers and Pressure Vessels on Vessels Admitted to American Registry. When foreign-built vessels are admitted to American registry, the OCMI shall direct the owners of the vessel concerned to submit all necessary plans to Commandant (G-MMT).

30-3-15E. SCUPPERS, SANITARY DISCHARGES, TANK OVERFLOWS, OVERBOARD DISCHARGES, ETC.

The regulations for passenger, cargo, and tank vessels contain requirements regarding the types of valves, covers, and other closing appliances for the various discharges which penetrate the hull of a vessel. The number and types of valves in a drain line are dependent upon both the space that is drained and on the location of the discharge opening in the vessel. If the discharge opening is located above the freeboard deck, it can logically be assumed that no water can enter the vessel through that opening and no valve is, therefore, required. However, if the discharge opening is below the freeboard deck, a non-return valve is necessary at the vessel's side to protect the watertight integrity of the vessel in case the drain line is ruptured. In addition, if the space being drained is below the freeboard deck, there is greater danger since the vessel could possibly be flooded through that line even though the drain line is not damaged.

Watertight superstructures are also considered to contribute to the safety of the vessel. Valves are necessary in discharges originating in such superstructures to protect them against the entrance of water. It is obviously impossible to anticipate all of the special cases which might occur. However, explanatory matter and sketches of installations which will be approved as meeting Coast Guard requirements are set forth in various Navigation and Vessel Inspection Circulars (NVC's). Proposed methods, other than those which are specifically illustrated in the NVC's, may also be approved if they meet the applicable requirements of the regulations. The regulations regarding overboard discharges and shell connections are in 46 CFR 56.50-95.

PART 30-5--CONSTRUCTION, CONVERSION, ALTERATION, AND REPAIR OF VESSELS

30-5-1. INTRODUCTION

The inspection of a vessel during construction or conversion is normally considered an initial inspection. The scope of such inspections and the standards for construction of vessels and equipment are covered in the applicable regulations. Initial inspection procedures are further covered in part 30-6 of this manual. The requirements for plans and specifications in connection with new construction, conversion, alteration, and repair of vessels are discussed in part 30-3 of this manual.

The following regulations require that the OCMI be notified of repairs or alterations affecting the safety of the vessel and, if the vessel is subject to inspection, also require that inspections be held:

- Marine Engineering - 46 CFR 50.05-10;
- Cargo and Miscellaneous Vessels - 46 CFR 91.45;
- Passenger Vessels - 46 CFR 71.55;
- Tank Vessels - 46 CFR 31.10-25;
- Electrical Engineering - 46 CFR 111.05-5;
- Public Nautical Schoolships - 46 CFR 167.30-1;
- Small Passenger Vessels - 46 CFR 176.20;
- Oceanographic Vessels - 46 CFR 189.45-1.

Inspections shall be made during the progress and upon completion of the work, as necessary, to determine that the vessel may be safely operated in the service in which it is employed. It is not the intent of the regulations to require reports or inspections by the OCMI when minor repairs consisting of replacements with spare parts are made.

When repairs are accomplished in a foreign port or under emergency conditions at sea, they must be reported to the OCMI at the nearest or first port where the vessel may call after such repairs are made. When such a report is received by the OCMI, he shall verify the efficiency of the repair and determine whether it is to be considered a temporary or permanent repair. The extent of the inspection should depend on the reported conditions. Whenever feasible, extensive examinations or tests (such as for boilers) may be delayed until the next periodic inspection. Final acceptance of repairs shall not be made until the OCMI is satisfied that all are satisfactory.

30-5-5. REFERENCES

30-5-5A. CODE OF FEDERAL REGULATIONS (CFR)

The regulations concerning the notification of the Coast Guard of repairs or alterations affecting the safety of a vessel or her machinery, and the movement of a vessel to another port for repairs, are contained in 46 CFR 2.01-15. Particular subchapter references are also listed.

30-5-5B. ABS PUBLICATIONS

The American Bureau of Shipping (ABS) has produced numerous publications which contain requirements and instructions for the production of sound, effective hull welds. Rules for Building and Classing Steel Vessels and Rules for Building and Classing Steel Barges for Offshore Service are examples of these publications. These rules are generally accepted by the Coast Guard as standards. See section 30-225B of this manual for a more complete list of ABS publications.

30-5-5C. ASME BOILER AND PRESSURE VESSEL CODE

46 CFR 57.02-1 states that the Coast Guard has adopted Section IX of the ASME (American Society of Mechanical Engineers) Boiler and Pressure Vessel Code, with certain limitations and modifications. Section IX is entitled "Welding Qualifications" and, as limited and modified, can be used as a standard for judging the quality of welds.

30-5-5D. REPAIRS TO STEEL HULLS

Inspection personnel shall become thoroughly familiar with the contents of Navigation and Vessel Inspection Circular (NVC) 7-68, Notes on Inspection and Repair of Steel Hulls. The information is furnished for guidance purposes in the inspection and repair of inspected vessels (see subpart 30-5-20).

30-5-10. CONSTRUCTION OF VESSELS

30-5-10A. GENERAL

Vessels to which the inspection laws and regulations apply shall be constructed in accordance with approved plans and specifications and the applicable laws and regulations.

30-5-10B. BULKHEADS AND DECKS

NVC 10-63 contains information concerning approved insulation, bulkhead panels, and deck coverings used on passenger vessels. The use of plywood for nonstructural interior bulkheads in the superstructure on existing ships which are certificated as cargo or miscellaneous vessels is acceptable, provided the requirements contained in 46 CFR 92.05 and 92.07-90 are met. It is realized that there may be other materials which would minimize fire hazards as required by 46 CFR 92.05 and 92.01 and they are recommended. There are presently no requirements which would prohibit the use of plywood on existing cargo vessels for the above-mentioned use. Plywood is prohibited, however, for nonstructural interior bulkheads in similar locations on passenger and tank vessels, and on all cargo and miscellaneous vessels of 4,000 gross tons and over contracted for on or after January 1, 1962.

30-5-10C. LIVING SPACES ON TANK VESSELS

The tank vessel regulations, 46 CFR 30-40, describe in general language the requirements governing construction of the accommodation spaces on tank vessels, namely: staterooms, hospital spaces, passageways, public spaces such as messrooms and recreation rooms, and other similar spaces. The regulations in 46 CFR 32.60-25 and 32.40-1(d) require the use of "fire-resistive material" for the construction and insulation of crew accommodation spaces on tank vessels. The term "fire-resistive material" as used in these regulations means noncombustible material approved under the specifications in 46 CFR 164.009 and listed as "incombustible materials" in the Equipment Lists, COMDTINST M16714.3 (old CG-190). It is intended that, within living spaces, all materials of construction, including panels and insulation, together with any materials used in the erection or for their support, shall be approved "noncombustible materials." The only combustible materials of construction permitted within the living spaces are decorative veneers and trim on the panels of staterooms and public spaces. No combustible materials are permitted in the passageways or in hidden spaces. There is no restriction on the type of furniture or furnishings to be used (see NVC 6-80).

30-5-10D. WELDED LAP SEAMS IN TANK BARGES

Some shipyards fabricate tank barges with lap-welded strakes since lap-welded construction in certain cases is cheaper and easier to complete than butt-welded construction; usually, small shipyards prefer lap-welded construction. Neither the Coast Guard nor ABS has published rules specifically limiting or prohibiting the use of lap-welded joints, and some lapped joints may be unavoidable from a practical point of view in any vessel construction (for example, tank barges usually have lapped joints at the turn of the bilge and at the deck edge). However, the use of lap-welded seams has the following disadvantages:

(1) A void is created in the lapped joint and this can form a gas pocket if the fillet weld on the inside is not tight. Several such gas pockets could make the gas-freeing of a cargo tank difficult. In addition, these voids could provide a route for leakage of gas or liquid cargo from one tank to another;

(2) There is no way to test the tightness of the inside fillet weld, since the usual methods of testing a tank will indicate leaks only if both the inside and outside welds of a lapped joint are not tight;

(3) An increased rate of corrosion is usually experienced in way of lapped joints;

(4) A tank with lapped joints is more difficult to clean than a smooth tank with butt-welded joints.

Lap-welded joints may be accepted in way of cargo tanks on tank barges if the following requirements are met:

(1) Welded stopwaters are provided in each lapped seam in way of oil-tight bulkheads;

(2) The overlap of the plates complies with ABS Rules, which specify that "Lapped joints are generally to have overlap of not less width than twice the thinner plate thickness plus one inch." The size of the overlap should not be excessive in order to avoid the creation of large void spaces;

(3) Joints are continuously welded on both sides.

In all cases, the use of lap-welded seams in tank barges is discouraged, but shall not be prohibited unless fabrication is found to be unsatisfactory by the inspector for the above or other faults.

30-5-10E. SINGLE-DOGGED HATCHES AND SCUTTLES

Hatches on inspected vessels generally are subject to the approval of the OCMI, depending on their suitability for the intended location on board and their use. There is no provision for type approval and normally they are not seen in detail on plans submitted for the OCMI's approval.

Hatches and scuttles having only a single dog or bolt for securing can be considered watertight and may be used in compartments such as voids or ballast tanks. However, these fittings are difficult to maintain as gastight and should not be permitted in cargo tanks or fuel tanks where the lack of a gastight seal poses a serious hazard. Three-dogged circular fittings and four-dogged oblong fittings are acceptable for such service.

30-5-10F. FIBERGLASS GRATINGS

Fiberglass gratings are not specifically addressed in the individual vessel regulations. However, limitations are imposed based on general requirements to reduce fire hazards and to provide for safe egress. Their suitability is therefore judged by the intended application and location. For example, the use of fiberglass gratings on board inspected vessels has been authorized in the following areas:

- Sea chest screening;
- Sun deck awnings and supports;
- Lifeboat bilge flooring;
- Electrical control flooring;
- Ship staging;
- Pipe guards on deck, in cargo holds, and in enginerooms;
- Fore and aft main deck catwalks;
- Main deck crossover catwalks.

Fiberglass gratings may not be used in an escape route from machinery or other spaces, firefighting stations such as foam monitors, or lifeboat embarkation areas. Questions concerning further application should be directed to Commandant (G-MVI-1).

30-5-15. TANK VESSEL REPAIRS AND ALTERATIONS

Both technically and administratively, the problem of avoiding accidents to tank vessels when under repair is extremely complicated, due to the possible presence of explosive gases and sources of ignition created by the use of flame- or spark-producing tools. Therefore, no repairs or alterations involving the safety of a tank vessel shall be made until the requirements of 46 CFR 35.01-1 have been met. These regulations set forth the provisions under which a certified marine chemist will make his decisions as to whether the work can be accomplished with safety (see subpart 30-5-45). A tank vessel may have "hot work" performed in or on the boundaries of a tank formerly containing flammable liquids only after the tank to be worked in has been cleaned and gas-freed by conventional methods and when the surrounding tanks have been cleaned and gas-freed, or inerted with carbon dioxide or water.

30-5-20. INSPECTION AND REPAIR OF TANK BARGES

30-5-20A. GENERAL

Tank barges employed primarily in river or inland service, and generally handled alongside or by pushing ahead as opposed to being towed astern, are subjected to the rigors of locking and fleeting operations which are not normally experienced by seagoing barges or individual self-propelled vessels. As a result of this unique service, some distinct structural problems have evolved.

Normal operations result in frequent structural deformation of a vessel's hull. The rubbing of barges against one another and against lock walls causes the hull plating in some areas of the vessel to wear thin (e.g., side plating against framing members, barge corners, ends, and knuckles), while the majority of plating remains in good condition. This rubbing of the plating not only diminishes the plate thickness in these areas, but causes plate deformation at the edge of the internals. Repeated deformation and metal working results in many weakened areas which are very prone to crack initiation and growth. Such degradation of strength of the product envelope (i.e., the barge hull) makes such barges prone to pollution incidents resulting from the minor damage of routine operations or low-energy collisions.

While the following guidance was developed to generally address the problems occurring on vessels in river service, the benefits of preventing possible pollution incidents through observation of the following guidelines may be universally realized. Therefore, this guidance should be considered applicable to all tank barges which have areas of the cargo envelope (excluding the deck) not protected by a double hull.

30-5-20B. INSPECTION STANDARDS

The extent and degree of inspection and types of repairs necessary to ensure that a vessel can operate safely will naturally depend upon the vessel's age, route, and other considerations. However, the operation of tank barges upon routes where there is minimal exposure to severe weather or sea conditions cannot justify imposing less stringent inspection or repair standards, if such relaxed standards may increase the likelihood of a pollution incident. The provisions of NVC 7-68 apply to all tank barges and shall be taken into account. The following additional notes are offered to assist in the inspection of single-hulled tank barges:

(1) When determining whether a deficiency compromises a vessel's suitability for its intended service, the possibility of a pollution incident arising from the deficiency must be considered. A vessel considered likely to cause a pollution incident is not suitable for carriage of oil in bulk;

(2) Tank barges are, of course, subject to all causes of deterioration noted in NVC 7-68. However, because of the frequent rigors of locking and fleeting operations, particular attention must be given to the end and side-shell plating which must withstand such continuous wear. Where such plating is stiffened by internal structural supports or bulkheads, the greatest loss in plate thickness can be expected. Often, plating in between structural supports will show little loss in plate thickness while plating supported by internals will be extremely thin;

(3) The acceptable degree of hull plating deterioration has traditionally been evaluated by considering the effect of the reduced plate thickness upon total hull strength. Specific limits for deterioration of various areas of the vessel have been suggested in NVC 7-68. Localized wastage in excess of these limits has generally been accepted if adjacent material retains adequate strength and the localized deterioration does not result in a radical change in cross section or a general weakening which could act as a notch. A further consideration for single-hulled tank vessels must be whether reduced thickness of the local area would allow product envelope penetration to be caused by low-energy impacts or abrasion encountered during handling in fleeting or locking operations. Here, the general guide of 25% deterioration indicated in NVC 7-68 applies. However, there are instances where renewal of hull plate should be required even though deterioration/wastage may be less than 25%. Examples of these instances are heavily or deeply pitted plating areas on vessels which were constructed with less than 3/8" original hull plating. In the latter case, 25% deterioration would mean plating of less than 1/4" as the only barrier between cargo and water. When plating becomes this thin, an evaluation must be made on a case-by-case basis to determine the strength of the product envelope and its ability to withstand the rigors of routine, unrestricted operations.

30-5-20C. REPAIR STANDARDS

The need for plate renewal is generally evaluated by considering the overall condition of the plate. However, in the case of tank barges which must withstand frequent fleeting and locking operations and where the hull plating is the only barrier between cargo and water, the condition of the plate in the way of internal structural supports should be the determining factor, even when the plating between internals shows negligible wastage. NVC 7-68 provides guidance on the use of gauging for evaluation of plate condition, and cautions against the use of gauging without sufficient cause. This should not be interpreted to preclude sufficient gauging during any inspection to adequately assess the condition of hull plating in the way of internal structural supports. The repeated rubbing of river service tank barges against lock walls and other barges can leave little evidence of loss of plate thickness in way of internals, and gauging may be necessary to reveal the true condition of such plating.

The rigors of unrestricted river operations generate problems other than thinning of plating on tank barges. The repeated working of shell plating against lock walls and other barges causes crack initiation and growth in many areas. Frequent handling of tank barges by towboats results in areas which are repeatedly struck and set in by low-energy impacts, with resulting formation of cracks in plating. Generally, the presence of more than two repaired cracks in one local area should be given special attention. The formation of a subsequent crack in such areas is likely. To avoid a possible pollution incident, such areas should be repaired through plate renewal or an insert. When cracks are repaired through welding, the repair procedures outlined in NVC 7-68 should be followed. The need for proper edge preparation and full penetration welds is emphasized.

When repairs involve the renewal of less than a full plate, an insert of less than 18"x18" normally should not be accepted (the guidance in NVC 7-68 applies). Marine inspectors shall ensure either that the edges of the insert lie in line with existing welds or that the corners of the insert have the proper radius.

Doubler plates are not acceptable as permanent repairs for tank barges. NVC 7-68 discusses the use of "patch plates." These cannot be considered acceptable repairs to any plating which is part of the product envelope. Often, however, rub pads or rub bar doublers are installed on tank barges in areas where excessive wear of the hull plating is detected or anticipated. When such a doubler is to be installed on an existing single-hulled barge, careful examination of the hull plating to be covered should be made to ensure that excessive wastage has not already occurred. In some cases, existing tank barges may have rub pads or rub bars which were installed without adequate evaluation of the hull plating. Removal may be necessary to ascertain the suitability of the original hull plating. Where half-round pipe is used as a rub bar, the hull plating beneath is often subject to accelerated corrosion. Gauging from inside the tanks or periodic removal of these bars may be necessary to ensure proper hull plating thickness. Where such rub bars extend across several tanks, the installation of water stops should be considered.

On tank barges in river service, the need for repairs to internal structural supports may be questioned because the stresses of heavy seas or weather conditions are not normally encountered and overall hull strength may seem less critical. However, when plating on single-hulled tank barges is not adequately supported, low-energy impacts or excessive stresses resulting from overloading can deform hull plating to the point of failure and result in pollution. The cargo envelope plating must always be provided with adequate stiffness to prevent underway panting, and must be able to distribute the force of low-energy impact loading uniformly along the internal structure of the vessel. If the internal structural supports have been substantially deformed from original conditions, or fail to have the designed amount of contact between support members and hull plating, consideration must be given to requiring renewal. The common practice of repairing internals on uninspected barges by welding "clips" to join distorted members to the hull plating cannot be considered acceptable on single-hulled tank barges if used extensively as a repair to internals. Isolated use of "clips" may be acceptable if the internals so repaired continue to provide substantially the designed amount of support to the hull plating. Repairs to internals should follow generally the guidance in NVC 7-68.

30-5-25. CARGO AND MISCELLANEOUS VESSEL REPAIRS AND ALTERATIONS

Repairs and alterations affecting the safety of these vessels are to be accomplished in accordance with the provisions of 46 CFR 91.45. Inspections shall be performed as necessary to determine that the vessel can be operated safely in the service in which employed.

30-5-30. PASSENGER VESSEL REPAIRS AND ALTERATIONS

Repairs and alterations affecting the safety of a passenger vessel are to be accomplished in accordance with the provisions of 46 CFR 71.55. Inspections shall be performed as necessary to determine that the vessel can be operated safely in the service in which employed.

30-5-35. SMALL PASSENGER VESSEL REPAIRS AND ALTERATIONS

Repairs and alterations affecting the safety of small passenger vessels are to be accomplished in accordance with 46 CFR 176.20. Inspections shall be performed as necessary to determine that the vessel can be operated safely in the service in which employed.

30-5-40. REPORTING STRUCTURAL FAILURES AND CASUALTIES

30-5-40A. DEFINITIONS

30-5-40A(1). Structural Failure. A structural failure may consist of either a fracture or a buckle occurring under normal operating conditions.

30-5-40A(2). Class 1 Structural Failure. A class 1 structural failure is any fracture or buckle which has weakened the main hull so that the vessel is lost or is in a dangerous condition. For this purpose, any fracture more than 10 feet long in the strength deck or shell shall be considered as putting the vessel into a dangerous condition.

30-5-40A(3). Class 2 Structural Failure. A class 2 structural failure is a fracture or buckle which does not endanger the ship but which involves the main hull structure at a location which experience has indicated to be a potential source of a dangerous failure. Such locations include the strength deck, inner bottom, side and bottom shell and attachments thereto, such as bilge keels and bulwarks.

30-5-40A(4). Class 3 Structural Failure. A class 3 structural failure is one which does not fall in classes 1 and 2.

30-5-40B. STRUCTURAL FAILURE REPORTS

30-5-40B(1). General. If a vessel suffers a class 1 structural failure, Commandant (G-MVI) shall be advised by message or telephone immediately. This report shall include the location and extent of the fracture, so that it can be determined if a Headquarters representative should be sent to examine the fracture. A sketch showing the fracture, as well as the proposed method of repair, shall be prepared as promptly as possible and submitted to Commandant (G-MMT). Repairs should not be undertaken until the proposed method of repair has been approved by Commandant (G-MMT). It is not intended to unnecessarily delay the completion of repairs and, if the fracture and the proposed method of repair can be adequately described by telephone, telephone approval may be possible. Form CG-2752, Report of Structural Failure, Collision Damage, or Fire Damage to Inspected Vessel, shall be submitted, with a copy to Commandant (G-MMI-3).

If a vessel suffers a class 2 structural failure at worst, Form CG-2752 shall be submitted to cover the failure.

Additional reports to the Commandant by message, telephone, etc., are not normally required. If a vessel suffers a class 3 structural failure at worst, Form CG-2752 need not be submitted. However, if a vessel structural problem or vessel class problem is indicated, due to the number and/or location(s) of failures, Form CG-2752 shall be submitted.

30-5-40B(2). Form CG-2752. This report should be supplemented with photographs and large-scale sketches emphasizing the point at which the fractures originated. The sketches and photos shall be clearly marked with the ship's name and reference points such as frame numbers, strake of plate, deck or shell, port or starboard side, etc. Arrows or lines should be used to point out the fracture and particularly its starting point. A letter of transmittal is not required to be submitted with Form CG-2752, but the form must be signed by the OCMI in the space provided.

Details regarding the starting point of the failure constitute the most important part of the report because all contributing factors are assembled at that point. A herringbone pattern appears on the edge of a fractured plate. The apexes of the angles of this herringbone point toward the starting point of the fracture. They show that it is possible to trace a fracture back to its source, and how it should be marked. When it is impractical to obtain a square view, photographs shall be taken at proper angles to clearly indicate the herringbone pattern on both sides of the starting point. Each photograph shall include the starting point. When accurate information regarding "Circumstances Surrounding Casualty" (Section II of Form CG-2752) is not available, the spaces shall not be left blank. The best available information shall be reported, such as the date on which the damage was found or examined, ports of departure and arrival, a statement as to loading ("Ballasted" or "Loaded"), and weather, temperature, sea conditions, and other pertinent data as it is recorded in the ship's log for the voyage. When information is approximate, it should be noted as such.

30-5-40B(3). Samples of Steel. Samples of steel from fractured vessels need not be obtained unless specifically requested by the Commandant. If samples are desired, Commandant (G-MMT) will issue appropriate instructions. Arrangements for the examination of samples at a testing laboratory will be made by Commandant (G-MMT) and shipping instructions will accompany the request.

30-5-40C. COLLISION DAMAGE REPORTS

Whenever a collision with another vessel or object results in the structure of the vessel being holed, Section IV (Collision Resulting in Structural Damage) of Form CG-2752 shall be completed and submitted.

30-5-40D. FIRE AND EXPLOSION REPORTS

Whenever there is fire and/or explosion damage to a vessel and/or its cargo, Section V (Fire/Explosion) of Form CG-2752 shall be completed and submitted.

30-5-40E. REPORT OF EQUIPMENT FAILURE ON INSPECTED VESSEL

Whenever approved systems or items of approved equipment (systems or items approved under an approval number) fail, or nonapproved systems fail and a dangerous condition results, Form CG-2752A, Report of Equipment Failure on Inspected Vessel, shall be submitted. This report is used to indicate failures only. It is not used to report replacements due to normal wear or deterioration.

30-5-45. USE OF NFPA-CERTIFIED MARINE CHEMISTS

30-5-45A. INSPECTIONS PRIOR TO HOT WORK

The following regulations require that an inspection be made before alterations, repairs, or operations involving "hot work" are undertaken in the area of oil tanks, oil lines, bulk chemical cargo tanks or adjacent spaces, etc.:

- Cargo and Miscellaneous Vessels - 46 CFR 91.50;
- Passenger Vessels - 46 CFR 71.60;
- Tank Vessels - 46 CFR 35.01;
- Public Nautical Schoolships - 46 CFR 167.30;
- Oceanographic Vessels - 46 CFR 189.50.

Normally these inspections are required to be made by a marine chemist certified by the National Fire Protection Association (NFPA). A list of certified chemists is contained in the NFPA Marine Chemists Directory, which is updated annually. When no marine chemist is reasonably available, the regulations provide for the OCMI to select and authorize another person to perform the required inspections. When not in a port of the United States and when no marine chemist or such person authorized by the OCMI is reasonably available, the regulations require that the inspection be made by the senior vessel officer present and a proper entry made in the vessel's logbook.

The publication entitled Control of Gas Hazards on Vessels to be Repaired, NFPA No. 306 (latest edition) shall be used as a guide for the inspections required and certificates issued before alterations, repairs, or operations involving "hot work" are performed as described above.

OCMI's should also become familiar with the OSHA requirements found in 29 CFR 1915.11 concerning flammable and oxygen-deficient atmospheres and tests made by "competent persons." OCMI's should discuss "hot work" procedures with local COTP's (in non-consolidated ports) and OSHA officials to ensure that vessel repairs are conducted safely and in such a manner that both Coast Guard and OSHA regulations are complied with.

30-5-45B. SUBSTITUTES FOR MARINE CHEMISTS

Under the regulations, it should be noted that the OCMI will be called upon occasionally to authorize another person to perform the required inspections when it is claimed that the services of marine chemists are not reasonably available. In reaching a decision in such cases, the OCMI should consider each case separately and on its own merits, keeping in mind the usual availability of marine chemists within reasonable distances, the impact of delays in securing marine chemists, the nature of the cargo which the vessel previously carried, etc.

If it is found necessary to authorize a person to perform a marine chemist's functions, an OCMI should give greatest consideration to those persons having long experience in the repair of vessels rather than those versed in theory alone. It is to be noted that a substitute for a marine chemist, when authorized by the OCMI, is limited by the regulations to act only in the case of an "individual vessel." Blanket authorization to such individuals to act in the case of more than one vessel is prohibited. Each vessel must be considered separately and each must be covered by a separate authorization.

When the OCMI's authorization of an individual to act in lieu of a marine chemist causes repeated and unreasonable delays, a local procedure may be set up to remedy the situation. The operating company should submit resumes to the OCMI, including background, education, and experience, on two or three of their employees or other persons whom they use regularly for testing and certifying. The OCMI can then make a determination as to their qualifications in advance of the need for their services. With this information, the OCMI can give verbal authorization to an individual in each case, subject to confirmation in writing. The verbal authorization should only be requested by, and granted to, a limited number of officials of the company and in each case should indicate the nonavailability of an NFPA-certified chemist as well as the name of the substitute proposed, a brief outline of the job, and similar matters necessary for record purposes.

Authorization for persons to act in lieu of a marine chemist should be in writing and should set forth names of those making the recommendations, the person recommended with his qualifications, the name of the vessel, the repair yard or repair point, and the date. Copies of these authorizations should be kept in a separate file marked "Marine Chemists, Authorized Substitutes For." From time to time, the OCMI may be asked to report on these authorizations in order to determine in which areas of the country additional marine chemists are needed.

30-5-45C. CERTIFICATION STANDARDS

The NFPA issues a certification to each person found to be a competent marine chemist, qualified to carry out the requirements of the current edition of NFPA-306, Standards for the Control of Gas Hazards on Vessels to be Repaired, which is adopted by the Joint Committee of the American Bureau of Shipping and the National Fire Protection Association.

30-5-45D. TYPES OF CERTIFICATES

The NFPA presently issues two types of certificates, unlimited and limited. An unlimited certificate is evidence that, in the opinion of the NFPA, the holder is competent to discharge the duties of a marine chemist in accordance with NFPA-306 on vessels of all types and sizes. A limited certificate is issued to those who, in the opinion of the NFPA, are competent to discharge the duties of a marine chemist in accordance with NFPA-306, but only in respect to self-propelled vessels designed for inland service and to non-self-propelled vessels. Holders of this class of certificate may not undertake to perform duties of a marine chemist on vessels of types other than those specified therein. It should be noted that the limited certificate is presently being phased out and that, in the future, the unlimited certificate will be issued to all marine chemists.

30-5-50. REPAIRS AND ALTERATIONS TO MARINE ENGINEERING EQUIPMENT

30-5-50A. GENERAL

The regulations in 46 CFR 59 apply to the repairs of all boilers, appurtenances, and pressure vessels subject to inspection by the Coast Guard. No repairs, replacements, or alterations shall be made without prior approval by the OCMI except in an emergency. The submission of plans and specifications for approval may be required as specified in 46 CFR 59.01-5.

30-5-50B. REPAIRS TO BOILERS, PRESSURE VESSELS, AND APPURTENANCES

30-5-50B(1). Boiler Repairs. The inspector may consider the opinions and recommendations of experienced boiler makers and welding engineers as to the best methods of repairing a boiler. However, the final decision as to what constitutes a satisfactory repair rests with the OCMI. The regulations regarding repairs to existing headers are set forth in 46 CFR 59.10. If no shop hydrostatic test is conducted on a repaired header, then the entire boiler with the repaired header installed shall be subjected to a test of 1.5 times the maximum allowable working pressure.

30-5-50B(2). Boiler Safety Valve General Requirements. Proposed repairs to safety valves must be approved by the OCMI before being undertaken. Safety valve repairs may be made by the original manufacturer or by an approved safety valve repair shop. The OCMI of the zone of the original manufacturer or the safety valve repair shop performing these repairs shall inspect the completed work and determine whether or not it is satisfactory for marine use. Whenever repairs require the replacement of parts, such parts, whenever possible, shall be made by the safety valve manufacturer. If parts cannot be secured from the manufacturer within a reasonable time, the repair shop may make the part itself or purchase it from another source. However, the inspector shall determine, by close visual examination, that the workmanship is good and that the repair has not been made in such a manner as to materially reduce the relieving capacity of the valve. The materials used in the replacement of parts of safety valves shall have corrosion- and heat-resistant properties at least equal to the material used by the manufacturer in the original construction. When parts are not supplied by the original manufacturer, the corrosion- and heat-resistant properties of materials shall be verified by examination of metallurgical reports covering the parts produced or used by the repair shop.

30-5-50B(3). Specification Requirements. If a new valve body is supplied, a tapped drain opening of a size and location as specified in 46 CFR 162.001-4(f) shall be fitted. After the repairs have been satisfactorily completed, the safety valve shall be set under steam pressure and shall meet the prescribed blow-down and popping tolerances as given in 46 CFR 162.001-4(i) prior to final acceptance.

30-5-50B(4). Marking Requirements. The name plate of the original manufacturer of the safety valve shall not be removed. If necessary to remove this name plate to perform repairs, it shall be replaced when the work is completed. In addition, if a valve body or nozzle is replaced which was not produced by the original manufacturer, the name plate of the repair shop shall be securely attached to the valve body. This corrosion-resistant name plate shall show the name and address of the company or person performing the repairs, the month and year the repairs were made, and the initials of the inspector accepting the repairs along with the impression of the Coast Guard symbol.

30-5-50B(5). Replacement Safety Valves. If a faulty safety valve is renewed, the inspector shall ensure that the replacement safety valve is suitable for the pressures involved and that it has sufficient relieving capacity.

30-5-50B(6). Renewal of Fusible Plugs. The chief engineer is required by 46 CFR 52.01-50(k)(2) to submit a written report to the OCMI who issued the COI when fusible plugs are renewed and there is no inspector in attendance. These reports shall be checked by the OCMI to determine that the proper plugs have been installed and to determine if additional inspections are necessary. The reports shall be filed with the other vessel inspection reports for the vessel.

When fusible plugs are installed with an inspector in attendance, the inspector shall determine that the plugs are of an approved type and properly installed, and enter in the inspection report the number and location of fusible plugs renewed in each boiler, the manufacturer and heat number of each plug, and the reason for renewal.

The only published source of approved heat numbers and manufacturers of fusible plugs is Proceedings of the Marine Safety Council, CG-129. Each OCMI is responsible for maintaining current records of the approved manufacturers and heat numbers. Inquiries on approvals should be referred to Commandant (G-MMT-2).

30-5-50C. TAIL SHAFT REPAIRS

The Coast Guard will accept welded repairs to tail shafts used on classed vessels when they meet the requirements of ABS. When possible, repairs and tests to such shafts shall be witnessed by an inspector. For these tail shafts and for those intended for use on unclassed vessels as well, the inspector shall determine:

(1) That the work was performed by a welder qualified or certified by the Coast Guard, U.S. Navy, or ABS; and

(2) That the welding repair is satisfactory.

The ABS Guide for Repair, Welding, Cladding and Straightening of Tail Shafts, details the procedures for repairing cracked steel shafts by welding. This guide also contains the requirements that a welding organization must pass prior to being qualified to repair cracked or corroded shafting by welding. In the case of unclassed vessels, these same recommended procedures should be used by the inspector as a guide in determining whether a satisfactory repair has been accomplished.

30-5-55. CONVERSION OF LST's

NVC 7-56 contains instructions on the structural reinforcement of Landing Ships, Tanks (LST's) being converted for manned operation in ocean, coastwise, or Great Lakes service. This circular also contains instructions for the inspection of these vessels subsequent to conversion.

NVC 11-63 contains the requirements for LST's converted to unmanned barges.

See also section 30-10-95B of this manual.

PART 30-6--INSPECTION OF VESSELS FOR CERTIFICATION

30-6-1. GENERAL

Certain vessels are required by law to be certificated by the Coast Guard. These laws require a complete inspection of the vessel by the Coast Guard prior to certification. The extent of such inspections (scope, standards, interval, etc.) is specified in the statutes and in certain treaties and is further amplified in regulations and policy instructions. The procedures to be used in the inspections are covered primarily by regulation and instructions, but in some cases are specified in the statutes or treaties.

This part of the manual provides guidance with regard to inspections leading to the issuance of a Certificate of Inspection (COI). Information concerning miscellaneous decisions and interpretations as a result of inquiries is also included. The guidance in this part may be amplified by additional information in other parts of this manual.

The responsibilities of the OCMI and the marine inspector for such inspections are discussed in Chapter 2 (Volume I) of this manual.

30-6-5. BACKGROUND AND AUTHORITY

30-6-5A. INSPECTION LAWS

The Coast Guard administers vessel inspection and safety laws and is required to inspect the vessels to which those laws apply. Many of these laws are contained in CG-227, Laws Governing Marine Inspection. It should be noted that the application of the laws to a particular vessel is based on many factors, such as trade or route, length, tonnage, number of passengers, etc. To avoid misunderstandings, the application of the laws should be determined with a particular vessel, type of vessel, or operation in mind. In verbal and written discussions concerning the application of the laws, hypothetical cases should be avoided if practicable.

Most of the laws pertaining to vessel inspection and safety establish the requirements for inspection. The statutes also authorize the Coast Guard to promulgate standards by regulation. There are exceptions to this, however, and certain requirements for vessels as to standards and procedures are contained within the law itself. Examples of statutory requirements are those requiring the names and home ports on vessels, the testing of boiler plates, and the submission and approval of plans. 46 U.S.C. 391, for example, contains specific provisions as to the scope of inspections. It is essential that all inspection personnel have a working knowledge of the laws under which they are operating.

There are certain laws affecting the safety of vessels which are administered by Government agencies other than the Coast Guard, such as the U.S. Customs Service, the Federal Communications Commission, the U.S. Public Health Service, and the Department of Labor. When a vessel is known to be in violation of laws administered by agencies other than the Coast Guard, the agency having jurisdiction shall be notified of the circumstances. Violations of laws not pertaining to marine safety but which are administered by the Coast Guard should be reported to the district commander (m) (see Chapter 17 (Volume I) of this manual).

30-6-5B. CONVENTIONS AND TREATIES

30-6-5B(1). The International Convention for Safety of Life at Sea (SOLAS), 1974. This convention contains standards and procedures affecting the inspection of certain passenger vessels and cargo vessels making international voyages. Its specific application is described in Article II and within the various chapters of the annexes to the convention. For the most part, the inspection requirements of the convention have been incorporated into Title 46, CFR (Shipping), so that the language of the convention itself is not of primary concern to the inspector when carrying out an inspection for certification. In determining the intent of a particular regulation in Title 46, CFR based on SOLAS requirements, a thorough knowledge of the convention's terms is essential. The countries which are parties to this convention are listed in part 8-2 (Volume I) of this manual.

30-6-5B(2). International Load Line Convention, 1966. This convention and the regulations promulgated thereunder in 46 CFR 42-46 (Subchapter E - Load Lines) contain standards for determining loading limits for vessels, the structure of the vessel, protection of openings, guardrails, freeing ports, and means of access to crew's quarters. Although the requirements of this convention as to vessel condition and maintenance are administered by the American Bureau of Shipping (ABS) or another "assigning authority" approved by the Commandant, they are of concern to the inspector in this evaluation of the condition of a vessel. It is necessary for inspection personnel to be thoroughly familiar with the standards required by this convention, the Load Lines Regulations, and the inspection procedures carried out thereunder. The responsibilities of the OCMI and inspector in the enforcement of the Load Lines Regulations are described in Chapter 76 (Volume V) of this manual. The countries which are parties to this convention are also listed in part 8-2 (Volume I) of this manual.

For those vessels which are not required to meet the Load Lines Regulations, consideration must still be given to hull structure and arrangement, freeboard, protection of openings, drainage, and the other items normally considered in the issuance of a Load Line Certificate. Since these items will not be checked by a load line "assigning authority" they must be given special attention by the inspector.

30-6-5C. RULES AND REGULATIONS

The regulations covering vessel inspection are promulgated under the Administrative Procedure Act (5 U.S.C. 551-559). While effective, these regulations have the force of law. All vessels shall be inspected for compliance with the rules and regulations to the extent that they are applicable to the vessel being inspected. The basic rules and regulations covering vessel inspection are found in Chapter I of Title 46, CFR. The application of the various subchapters or sets of regulations is indicated therein. In addition, each of the principal subchapters contains a table which explains their application. The regulations also contain specific standards and procedures for the inspection of vessels. The process by which regulations are adopted, changed, and deleted is described in 33 CFR 1.05 and in part 7-1 (Volume I) of this manual.

Most of the subchapters of Chapter I of Title 46, CFR concerning vessel inspections have been published separately as follows:

- B - CG-191, Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel;
- C - CG-258, Rules and Regulations for Uninspected Vessels;
- D - CG-123, Rules and Regulations for Tank Vessels;
- F - CG-115, Marine Engineering Regulations;
- I - CG-257, Rules and Regulations for Cargo and Miscellaneous Vessels;
- J - CG-259, Electrical Engineering Regulations;
- P - CG-268, Rules and Regulations for Manning of Vessels;
- T - CG-323, Rules and Regulations for Small Passenger Vessels.

The following subchapters of Chapter I of Title 46, CFR also apply to vessel inspections but have not been printed separately:

- A - Procedures Applicable to the Public;
- G - Documentation and Measurement of Vessels;
- N - Dangerous Cargoes;
- O - Certain Bulk Dangerous Cargoes;
- Q - Specifications;
- R - Nautical Schools;
- U - Oceanographic Vessels.

The following subchapters of Chapter I of Title 33, CFR relate to vessel inspection:

- A (part 19) - Waivers of Navigation and Vessel Inspection Laws and Regulations;
- D (part 80) - Pilot Rules for Inland Waters;
- D (part 84) - Towing of Barges;
- E (part 90) - Pilot Rules for the Great Lakes;
- F (part 95) - Pilot Rules for Western Rivers;
- H (part 105) - North Atlantic Passenger Routes;
- N (parts 140-147) - Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf.

Certain of the regulations in Chapter I of Title 33, CFR relating to vessel inspection have been printed separately as follows:

- CG-169, Navigation Rules, International-Inland;
- CG-172, Rules of the Road, Great Lakes;
- CG-184, Rules of the Road, Western Rivers;
- CG-320, Rules and Regulations for Artificial Islands and Fixed Structures on The Outer Continental Shelf.

Subchapter C (Chapter I) of Title 49, CFR has also been reprinted, as CG-108, Rules and Regulations for Military Explosives and Hazardous Munitions.

30-6-10. CERTIFICATION OF VESSELS

30-6-10A. GENERAL

Various laws, including 46 U.S.C. 390-390g, 391a, 392, 395, 397, 399, and 400, require that vessels be in possession of a COI. The issuance of the certificate is dependent upon the satisfactory completion of an inspection for certification. The retention of the COI is dependent upon the continued maintenance of the vessel in a safe operating condition.

The regulations in 46 CFR 2.01-5, 31.05, 71.01, 91.01, 157.15, 167.60, 176.01, and 189.01 contain requirements pertaining to COI's.

30-6-10B. FORMS

30-6-10B(1). Form Numbers. Under the provisions of 46 CFR 176.01 and 70.05-15, Certificate of Inspection Form CG-3753 shall be issued to all small passenger vessels inspected under Subchapter T. The Barge Certificate of Inspection, Form CG-4678, shall be issued to all inspected tank, cargo, and miscellaneous barges. Form CG-841 or CG-3753, as appropriate, shall be issued to all other vessels required to be certificated.

30-6-10B(2). Posting of Forms. Placards, forms, and instructions in laminated acetate or framed under clear plastic have previously been accepted in lieu of framing under glass as required by the regulations. However, no policy has been previously established with respect to acceptable alternate methods or materials for placards, forms, and instructions which are not required to be framed under glass. Because of the wide variety of methods for making and posting such forms, the following policy applies to those forms required to be posted aboard vessels:

(a) If the forms are required to be framed under glass, the following applies:

(i) Printed placard forms may be laminated in clear plastic or framed under clear sheet plastic;

(ii) Forms which must be removed from framing for entries or signature may be framed under clear sheet plastic.

(b) If the forms are not required to be framed under glass, the following is acceptable:

(i) Frame under glass;
(ii) Laminate in clear plastic or frame under clear sheet plastic;
(iii) Mount with pressure-sensitive backing suitable for direct application to bulkheads with clear plastic protective film over face of form;
(iv) Use materials or methods which, in the opinion of the OCMI, provide adequate legibility and are otherwise suitable for the purpose.

30-6-10C. CONDITIONS PRECEDING ISSUANCE

The OCMI is authorized to issue COI's (Forms CG-841, 3753, or 4678) or Temporary Certificates of Inspection (Form CG-854) for certain purposes, to vessels required to be inspected, provided he is satisfied that the vessel may be operated in the proposed service for the duration of the certificate with safety of life and property. In addition, the OCMI shall be satisfied that the vessel complies with all applicable laws, rules and regulations.

30-6-10D. PERIOD OF VALIDITY

The period of validity for a COI varies with various types of vessels and is specified within the applicable regulations. In general, the period is one year for passenger and nuclear vessels; two years for cargo, tank, oceanographic, and miscellaneous vessels; and three years for small passenger vessels. It is not intended that certificates be issued for periods less than those specified in the applicable regulations. A vessel should be certificated on the basis of her ability to meet the minimum safety standards as set forth in the regulations. Under existing law, any vessel meeting these standards is entitled to a full-term certificate. A vessel unable to meet the minimum standards shall be required to correct her deficiencies prior to certification, or, if the deficiencies are minor and do not within themselves make the operation of the vessel unsafe, a reasonable time shall be granted to the owners in which to make the necessary corrections.

Recognizing that there are cargo, tank, and miscellaneous vessels which require an exception to the concept of a full two-year COI, the regulations permit the issuance of a one-year COI to vessels with firetube main propulsion boilers, including river-type lap seam boilers, and vessels in special service or whose operations are confined to specific areas. Under these regulations, the OCMI shall conduct the inspection for certification of all cargo, tank, and miscellaneous vessels on a two-year basis and shall issue COI's for two years with the exception of the following:

(1) Vessels on the Great Lakes or tributaries thereto which are normally placed out of service for extended annual periods;
(2) Vessels equipped with firetube main propulsion boilers;
(3) Those vessels which, in the opinion of the OCMI, should be inspected on a one-year basis by reason of route (the Commandant's approval shall be obtained in these cases);
(4) Nuclear vessels.

An owner may surrender the COI prior to the expiration date and apply for inspection for re-certification at any time. The conditions under which certain vessels on foreign voyages may return to the U.S. with expired certificates are discussed in section 30-6-10H.

30-6-10E. ENTRIES ON CERTIFICATES OF INSPECTION

30-6-10E(1). General. The entries required on a COI are discussed in detail in Chapter 20 of this manual. In addition, miscellaneous decisions and interpretations affecting COI entries are discussed in section 30-6-10H.

30-6-10E(2). Number of Passengers. Except for ferryboats, the OCMI is initially responsible for determining the number of passengers that a vessel has accommodations for and can carry with prudence and safety, as provided for in 46 U.S.C. 451. The number shall be stated on the COI. The OCMI shall not permit the number of passengers allowed to exceed the number permitted by law or regulation, or that which is specified in the vessel's stability letter.

See paragraph 30-6-10H(4) concerning the statement of the number of passengers on a ferry vessel's COI, and subpart 30-10-15 for discussion of limiting the number of passengers carried on an excursion vessel.

30-6-10F. SEASONAL RESTRICTIONS

COI statements of seasonal restrictions shall be as descriptive as possible, showing limitations on vessel routes, the scope of passenger-carrying authorizations, and the like. Seasonal limitations are intended to ensure the overall seaworthiness of the vessel and the safety of the passengers carried under differing operational conditions without completely halting the operation of the vessel during any specific period of time.

30-6-10G. TEMPORARY CERTIFICATES OF INSPECTION

A Temporary Certificate of Inspection (Form CG-854) shall be used to provide evidence on the vessel of the satisfactory completion of an inspection for certification (see 46 U.S.C. 399). It stands in lieu of a COI and, until it is replaced by a COI, it has all the force and effect of the permanent certificate. The temporary certificate is intended for use when the immediate issuance of a COI is not possible at the completion of an inspection. When the permanent COI can be issued in time to meet the vessel's needs, no temporary certificate should be issued. Also, it is not the Commandant's intention that a COI be withheld pending correction of minor deficiencies after a temporary certificate has been issued.

30-6-10H. CERTIFICATES EXPIRING AT SEA

30-6-10H(1). Certificate Extensions. There are no statutory provisions which allow for the extension of a COI. Requests for extensions of certificates shall be denied.

30-6-10H(2). Exemptions on Foreign Voyages. Questions have arisen concerning an interpretation of that part of 46 U.S.C. 399 which exempts vessels which normally operate on a regularly established line from West Coast ports to Oriental ports, and which do not normally stop in Hawaii but may occasionally stop there, from the requirements of having on board an unexpired COI. 46 U.S.C. 399 provides that a vessel operated upon a regularly established line from a port of the United States to a port of a foreign country not contiguous to the United States may complete a voyage within 30 days after the expiration of its COI at sea, in a foreign port, or a port in Hawaii.

The significant and controlling qualification that a vessel must meet to avail itself of this exemption is found in the phrase ". . . any such vessel operated upon a regularly established line." This phrase obviously excludes "tramp vessels" having no regular itinerary; it does not exclude vessels normally operated upon regularly established lines that occasionally call at ports in Hawaii. The question of whether or not a vessel arriving with an expired COI shall be required to undergo an inspection for certification can be resolved by answering these questions:

(a) Is the vessel on a regular established run as interpreted above?

(b) Will the vessel complete its voyage within 30 days of the date of the expiration of her certificate?

If the answer to both questions is "yes", no inspection for certification is necessary.

30-6-10H(3). Vessels Sailing Less than 15 Days Prior to Expiration of Certificates. 46 U.S.C. contains a limitation that prevents the grace period from being applied if the COI would expire within 15 days of the date of sailing.

A vessel would not violate the provisions of the law merely by sailing to a foreign port within 15 days of the expiration of the COI so long as it can complete a round trip to that port in less than 15 days before the certificate expires. However, such a vessel would be in violation if it sailed within 15 days of the expiration date and remained out after the expiration of the certificate. See subpart 30-13-5 regarding the completion of voyages.

30-6-10H(4). Home Port of Vessels. Questions have arisen concerning a vessel having a hailing port painted on the stern and the home port indicated in the vessel's documents, particularly on the COI, when both ports are within the same customs district.

46 U.S.C. 46 and 46 CFR 67.13 govern the marking of the hailing port on the stern of a documented vessel. The hailing port so marked may be the port where the vessel is documented, the place in the same district where the vessel was built, or the location where one or more of the owners reside. Customs officials have indicated that it is permissible to designate any port within the customs district as the hailing port of a vessel. The vessel's homeport, however, is the port where the certificate of documentation is issued and record-

ed. The home port as indicated in the vessel's certificate of documentation should be entered on the COI.

30-6-10H(5). Maximum Passengers on Ferry Vessels. 46 U.S.C. 451 and 452 prohibit a requirement for specification on the COI of a ferryboat of the total number of passengers allowed; requirement of an entry stating the total number of persons (passengers and crew) allowed is also prohibited. However, in the case of small passenger vessels (including ferry vessels) inspected under 46 U.S.C. 390, the COI may specify the maximum number of passengers and total number of persons permitted aboard. Also, when the OCMI and the owner of a ferry vessel reach an agreement on the number of passengers that can be carried safely, and when the owner of the ferry desires it, the maximum number of passengers permitted may be continued to be entered on the COI.

When stability is a factor in limiting the maximum number of persons that can be carried with safety on any ferry vessel, the total persons permitted aboard shall be stated in the stability letter.

30-6-10H(6). Tankships Carrying Grain Cargo. No amendment of the COI is necessary for a tankship to carry grain cargo.

30-6-10I. U.S. VESSELS OPERATING IN FOREIGN WATERS FOR EXTENDED PERIODS

Questions have arisen concerning the proposed operation of a U.S. tank vessel as follows:

"The vessel will be permanently anchored in Venezuelan territorial waters for the express purpose of crude oil storage to be thereafter transferred to vessels coming alongside. While the vessel is permanently anchored, the plant would be kept in operation on a standby basis so that, in the event of emergency, the vessel could be moved to a place of safety. The vessel would be manned by two licensed deck officers and two licensed engineers. The primary functions of the licensed officers would be to generally maintain the vessel, to supervise the transfer of cargo from its tanks to other vessels, and to direct the movement of the vessel should it become necessary."

As a U.S. vessel, the vessel would be subject to inspection and certification under 46 U.S.C. 391a and 46 CFR 30-40 (Subchapter D - Tank Vessels). With regard to the manning of such vessels, as stated under 46 CFR 31.15- 1, the OCMI who inspects the vessel shall make an entry on the COI specifying the complement of officers and/or crew which, in his judgment, will be necessary for its safe operation. The complement may be changed from time to time, by endorsement on the certificate by the OCMI, as a result of changed conditions or employment.

Under the regulations, special manning requirements may be set governing special operating conditions of the vessel. Such special endorsements would necessarily have to be within the limitations imposed by applicable laws relating to the manning of vessels. It should be noted that a vessel holding a valid COI is required to be manned according to the requirements set forth upon the certificate.

In view of the language of 46 U.S.C. 399, it is evident that such a vessel could not be navigated legally without a valid COI. Therefore, it appears that the vessel could not be exempted from inspections by permanent anchoring in Venezuelan waters, but would be required to submit to periodic inspections for certification as required by law.

30-6-10J. VESSELS INTENDED FOR SALE TO FOREIGN INTERESTS

30-6-10J(1). Construction for Foreign Sale. When it is definitely known during the construction of a vessel that it will not operate under U.S. flag after delivery, it is difficult to justify assignment of inspectors to examine the construction of such a vessel. Inspection of vessels intended for operation under foreign flag would result in a much greater workload being imposed, for which the Coast Guard has neither the authority nor the means available to undertake. Coast Guard authority and responsibility to inspect new construction rests upon the jurisdiction which accrues when the vessel enters service under the U.S. flag and becomes subject to U.S. inspection laws. For this reason, when inspection is requested for a vessel being built for sale to foreign interests, the OCMI shall inquire whether the vessel is intended to be operated under U.S. flag. If the reply is yes, inspection should be undertaken after receipt of an application for inspection from a citizen legally entitled to have the vessel documented under U.S. law. If the reply is no, inspection should not be undertaken.

30-6-10J(2). Towing of Vessels Permanently Laid Up, Dismantled, and Out of Commission. The incidence of towing vessels by sea for purposes of permanent removal from navigation or scrapping has shown a marked increase as large number of vessels built in the 1940's and '50's reach the end of their economic life. Because of this, a re-examination of the laws and regulations bearing on this situation has been made. In general, it has been determined that such vessels, making a one-way voyage under tow, without cargo or passengers, unmanned, and not holding documents as a merchant vessel, are not subject to inspection and certification by the Coast Guard since they do not lose their status of being "laid up and dismantled and out of commission" as envisioned in 46 U.S.C. 391 and 46 CFR 90.051(a)(3); nor are they vessels intended for a "service" or to be "used in navigation" as contemplated by the Seagoing Barge Act (46 U.S.C. 395).

In accordance with this determination, and irrespective of the particular wording of 46 CFR 90.05-25, as long as the cognizant OCMI is satisfied by documentary evidence or other means that certain conditions are met, such vessels do not require a COI nor a Load Line Certificate. These conditions are that the vessel:

(a) Is not documented by the Coast Guard;
(b) Will carry no passengers or cargo;
(c) Will be towed and will not be manned;

(d) Is making a one-way voyage for purposes of scrapping or permanent removal from navigation;

(e) Is not intended to be used in commerce; and

(f) Will pose no threat to life, property, or the environment while in U.S. waters.

The U.S. Customs Service has been consulted in this matter. Although such vessels require clearance before being towed to a foreign port, verification by the OCMI to the effect, "(name of vessel), being towed on a one-way voyage for purposes of scrapping, etc., is not required to hold a Certificate of Inspection", will suffice for clearance purposes. When the matter of what constitutes cargo will be at issue, Commandant (G-MVI) should be consulted.

Scrap metal carried for ballast in such vessels will not be classed as cargo to meet the requirements above, as long as the amount, location, and method of stowage of this scrap is acceptable to the OCMI and shall not exceed the tonnage of liquid ballast which would normally be employed.

Such vessels will, however, require a Load Line Certificate (see section 76-3-1C (Volume V) of this manual regarding the issuance of an exemption certificate). For vessels transiting the St. Lawrence Seaway under their own power for decommissioning in other than a U.S. port, which are subject to the Loadline Act (46 U.S.C. 85 et seq) and the vessel inspection laws, a load line is required and the vessel must be certificated before leaving a U.S. port.

NOTE: Nothing stated above is intended to contravene any requirements that the Canadian government may have with respect to passage through Canadian waters and clearance from Canadian ports. Vessel owners shall be advised to contact the Director, Marine Regulations Branch, Department of Transport, Ottawa, Ontario, Canada, for information regarding such matters. Owners of vessels intending to transit the waters of other countries will be advised to contact the responsible officials of those countries.

30-6-10K. INSPECTION OF U.S. VESSELS IN FOREIGN COUNTRIES

(To be developed.)

30-6-10L. VESSELS OPERATING IN SOUTHEASTERN ALASKA

46 CFR 2.01-80 states that the waters of southeastern Alaska inside of the general trend of the shore from Cape Spencer, southeasterly to Cape Muzon, and thence easterly to Sitklan Island, shall be considered as "bays, sounds, and lakes other than the Great Lakes," for the purpose of administering the vessel inspection laws and Chapter I of Title 46, CFR (Shipping).

The waters between southeastern Alaska and Prince Rupert, British Columbia, via Chatham Sound have been classed as lakes, bays, and sounds for the purposes of vessel inspections. The "Inside Passage" between southeastern Alaska and Puget Sound is considered as lakes, bays, and sounds for vessel inspection and licensing purposes only if certain conditions are met. Approval by Commandant (G-MVI) is required when permitting vessels to operate between southeastern Alaska and the State of Washington under these considerations.

30-6-15. PREINSPECTION PROCEDURES

30-6-15A. APPLICATION FOR INSPECTION

Application for inspection of a vessel for certification shall be made by the master, owner, or agent on Form CG-3752, Application for Inspection of U.S. Vessel (see 46 CFR 2.01-1 and 176.01-10). The application for initial inspection of a vessel being newly constructed or converted shall be submitted prior to the start of such construction or conversion. Application for inspection of such vessels shall be preceded by the submission of the plans and specifications required by the applicable regulations.

Applications for inspection shall be submitted to the OCMI having inspection jurisdiction over the vessel. Applicants submitting Form CG-3752 in person to an OCMI other than the OCMI having jurisdiction shall be advised of the correct procedure. When an application is received by mail at an office other than the office having jurisdiction, it shall be forwarded to the OCMI having jurisdiction, and the applicant shall be so advised. An inspection for certification shall not be commenced until a proper written application has been submitted by a U.S. citizen and the proposed operation of the vessel (use, route, passengers, etc.) is known to the OCMI and the inspector.

30-6-15B. PREPARATION BY THE INSPECTOR

The marine inspector shall be as well-informed as possible concerning the vessel's proposed operation and its past history before commencing the inspection. Due to the many differing circumstances encountered, the availability of such information will vary. In general, however, the following procedures shall be used when practicable:

(1) Before an inspection for certification is begun, previous inspection records shall be made available to the inspector. For the initial inspection, copies of all approved plans, specifications, and relevant correspondence shall also be made available to the inspector.

(2) When a vessel previously inspected in another zone applies for inspection, the OCMI should request that the inspection records for at least the previous inspection for certification and drydocking examination be forwarded to him for review. There shall be no delay to the vessel, except in special cases, as a result of previous inspection records not being received prior to the completion of an inspection. Such records shall be returned after the inspection is completed unless the vessel has permanently changed her principal port of operation to the new inspection zone (see section 30-2-20B of this manual).

(3) Any record of outstanding deficiencies shall also be made available to the inspector.

30-6-20. INITIAL AND SUBSEQUENT INSPECTIONS FOR CERTIFICATION

30-6-20A. INITIAL INSPECTIONS

30-6-20A(1). General. The initial inspection for certification is the first inspection held on a vessel during or after construction or conversion. It is a prerequisite to the issuance of the original COI.

30-6-20A(2). Purpose. At the initial inspection, the inspector shall ascertain that the vessel has been built (or converted) and equipped in accordance with the applicable regulations, construction standards, and approved plans and specifications, and that it is in a condition to warrant the belief that it can be operated with safety to life and property in the service and on the route(s) specified. The inspector shall also ensure that the condition of all equipment and apparatus and the installation thereof comply with applicable regulations.

30-6-20A(3). Intent. It is intended that the initial inspection be carried out with special attention to detail. All unusual circumstances which require special interpretations of regulations, special considerations, the use of substitutions or equivalents, etc., shall be carefully considered; when deemed acceptable to the Coast Guard, they shall be made a matter of record (see 46 CFR 50.20-35).

When possible, the initial inspection shall be conducted throughout the construction and fitout period, with a final inspection of the condition of the vessel and its equipment upon completion of the construction and fitout. Vessels being converted shall be inspected throughout the conversion period. The inspector shall call the attention of the builder and contractor to any defects noted as soon as practicable after discovery so that timely corrections can be made. The inspector shall notify the OCMI of any controversial items so that they may be resolved, if possible, before work continues (see subpart 30-2-10 for the handling of deficiencies).

30-6-20A(4). Scope. The regulations covering the scope of initial inspections are as follows (CFR subchapters in parentheses):

- Passenger Vessels (H) - 46 CFR 71.20;
- Cargo & Miscellaneous Vessels (I) - 46 CFR 91.20;
- Tank Vessels (D) - 46 CFR 31.10;
- Small Passenger Vessels (T) - 46 CFR 176.05-5;
- School Ships (Public) (R) - 46 CFR 167.15;
- School Ships (Civilian) (R) - 46 CFR 168.05;
- Electrical Inspections (J) - 46 CFR 111.05-10C;
- Oceanographic Vessels (U) - 46 CFR 189.20.

The inspection shall be sufficient to determine that the vessel is suitable for the service and route(s) in which it is to be employed; is equipped with the proper appliances for lifesaving and fire protection as prescribed by the regulations; has suitable accommodations for passengers and crew; is in a condition to warrant the belief that it may be used in navigation with safety to life, property, and the environment; and in all other respects fully complies with the applicable requirements of the laws and regulations. To this end, the inspector and the OCMI shall be satisfied, by thorough examination, that the boilers and pressure vessels and appurtenances thereof, propelling and auxiliary machinery, electrical apparatus, and all other equipment are in conformance with the applicable laws and regulations. All boilers, pressure vessels, and main steam piping shall be subjected to hydrostatic tests-or such other tests as are prescribed in the regulations.

Stability tests shall be carried out as provided in part 30-4 of this manual, and the procedures for checking welds shall be carried out as provided in Chapter 33 of this manual.

30-6-20A(5). Compliance with Plans and Specifications. When inspecting new construction or conversion, it is essential that the inspector have available corrected copies of the approved plans and specifications. In this regard, copies of the approved plans and specifications furnished to the OCMI shall be considered work copies furnished for the use of the inspector during construction, and for the office files after completion of the construction. If additional copies are needed for office use or filing, additional copies shall be requested from the submitter.

It should be noted that most plans and specifications are approved subject to comments placed in their transmitted letter. These letters are referred to in the approved plans and specifications and shall be made available to the inspector who inspects the construction or conversion work. When an approval is subject to comments or recommendations of ABS or another recognized classification society, such comments or recommendations shall also be made available to the inspector.

In the approval of plans or specifications, each installation must be made to the satisfaction of the cognizant OCMI. Thus, the inspector shall check the complete installation for safety and compliance with applicable standards as well as the plans and specifications. Any errors or omissions in the plans which would cause or permit construction not complying with applicable standards, or which is not safe, shall be brought to the attention of the builder and the OCMI promptly for resolution.

30-6-20A(6). Trial Trips. An inspector is required to observe the operation of each new vessel during a trial trip, upon completion of the vessel, and before initial certification. The specific regulations covering trial trips are in 46 CFR 58.01-30 and 31.10-40, but other regulations are also applicable with regard to initial inspections.

A new vessel on a trial trip is not required to have a COI; Not having or requiring a COI, the vessel necessarily will not possess a certificate of documentation issued by the Coast Guard. As a matter of practical policy, the Coast Guard has not insisted on strict interpretation of COI requirements in the case of a new vessel on a trial trip. This is based on the facts that a trial trip is usually of short duration; that Coast Guard inspectors are frequently on board during a trial trip; that a trial trip is one of the final incidents of Coast Guard inspection prior to the issuance of the first COI; and that a new vessel on a trial trip usually carries the equipment required to receive a COI and is manned by licensed and certificated personnel.

The inspector assigned to a trial trip as an observer does not supervise and instruct personnel relative to the equipment undergoing test. Although specific matters may be referred to the inspector for advice, the supervision of the tests according to the trial schedule rests with the builder's representatives. However, as part of the initial inspection of any vessel, the inspector may require such tests as he deems necessary to be assured of the safety and seaworthiness of the vessel.

30-6-20A(7). Restricted Visibility From The Navigating Bridge. Restricted visibility from the navigating bridge is most often encountered on container vessels, on large tank vessels with the bridge aft, or on special purpose vessels such as mobile drilling units. However, the problem may be encountered on any type of vessel. It is anticipated that, in most cases, this problem will be dealt with during the plan-review stage. However, in those cases where restricted visibility becomes apparent after the start of construction, the matter should be brought to the attention of the owner as early as possible in order to avoid costly modifications late in the construction of the vessel.

The causes of restricted visibility from the navigating bridge can be separated into two broad categories: those where the obstruction is movable or temporary, such as container deck loads; and those where the obstruction is permanent, such as a vessel structure. Those situations in the first category are considered to be operational in nature. Certification of a vessel with this type of visibility restriction should not be withheld; however, the problem should be brought to the attention of the owner so that he may take such action as he deems appropriate. Situations in the second category, being permanent in nature, cannot be operationally controlled after the vessel is in service. Therefore, a vessel with the latter type of obstruction should not be certificated when, in the opinion of the OCMI, the visibility from the navigating bridge is restricted to such a degree that the vessel cannot be navigated safely.

30-6-20B. SUBSEQUENT INSPECTIONS FOR CERTIFICATION

30-6-20B(1). General. Inspections for certification are the periodic inspections held after the initial inspection.

30-6-20B(2). Intent. At an inspection for certification, the inspector shall ascertain that the vessel and its equipment are being maintained in a safe condition, in accordance with applicable laws and regulations, and whether changes have occurred in the vessel which would tend to make its continued operation unsafe. It is intended that these periodic inspections be carried out with special attention to the condition of the vessel and its equipment. Deficiencies noted shall be handled as provided in subpart 30-2-10 of this manual.

During the inspection, the inspector shall be especially alert to detect unauthorized changes to the vessel and its equipment since the last inspection. Upon completion, the inspector and the OCMI must be satisfied that the vessel may be operated safely in the proposed service for the period covered by the COI and that it otherwise complies with the applicable laws and regulations.

30-6-20B(3). Appraisal of Condition. The determination of the true condition of a vessel and her equipment is sometimes difficult, particularly when the vessel has aged. The determination of the strength remaining in a vessel involves many factors in addition to age, route, and trade, and does not lend itself readily to specific percentages of wastage. Also, the condition of machinery and equipment cannot always be determined by inspection or test.

A fair appraisal of the condition of a vessel and its equipment necessitates experience, technical knowledge, and sound judgment on the part of the inspector, plus cooperation from the vessel's owner, crew, officers, and other agencies interested in the safety of the vessel. The proper balance between economy of operation and safety can only be achieved with full cooperation, mutual assistance, and a frank exchange of information among those directly concerned. In order to bring about this cooperation, there must be a working liaison between the OCMI, the local representative of the classification society, and the owners of the vessel.

In the appraisal of the condition of a vessel and its equipment, the inspector shall use all of the facts and evidence available, including the latest inspection findings; records of previous Coast Guard inspections; the opinions or records of other interested parties based on their surveys or inspections; facts revealed by the opinions of the officers and crew; the fact of classification; and the fact of previous certification (caution: see 46 U.S.C. 234 concerning the disclosure of sources of information). He may seek the advice of experts in the particular field involved, such as boiler-makers, shipfitters, welders, etc., or may seek the opinion of more experienced inspectors or technical personnel assigned to the Coast Guard unit. From the evidence available to him, and from his own inspection, he shall reach an independent conclusion as to vessel and equipment conditions and shall take appropriate action accordingly. The OCMI shall be consulted when there is doubt in the inspector's mind as to a proper course of action to be taken.

30-6-20B(4). Scope of Inspection. Regulations covering the scope of inspections for certification held after the initial inspection are as follows:

- Passenger Vessels (H) - 46 CFR 71.25;
- Cargo & Miscellaneous Vessels (I) - 46 CFR 91.25;
- Tank Vessels (D) - 46 CFR 31.10-15;
- Small Passenger Vessels (T) - 46 CFR 176.05-10;
- Nautical School Ships (Public) (R) - 46 CFR 167.15;
- Nautical School Ships (Civilian) (R) - 46 CFR 168.05;
- Tests and Inspections (F) - 46 CFR 61.10;
- Oceanographic Vessels (U) - 46 CFR 189.25.

The inspection shall be sufficient to determine that the vessel is of a structure suitable for the service in which it is to be employed, is equipped with the proper appliances for lifesaving and fire protection as prescribed by appropriate regulations, has suitable accommodations for passengers and crew, is in a condition to warrant the belief that it may be navigated safely, and that the vessel is in all other respects in full compliance with the applicable laws and regulations as they apply to the vessel being inspected.

The inspector shall also determine, by thorough examination, that the boilers and appurtenances thereof, the unfired pressure vessels and appurtenances thereof, the propelling and auxiliary machinery, the electrical apparatus, and the equipment of the vessel all conform with the applicable laws and regulations, and that the vessel may be safely employed in the service proposed.

30-6-25. HULL INSPECTIONS

30-6-25A. GENERAL

The inspector shall determine the adequacy of the complete hull structure by the review of plans before construction, by examination of and checking with approved plans during construction, by periodic examinations of the hull after construction, and by examination of any repairs or alterations. The approved plans and the ABS Classification Certificate may be accepted by the OCMI in certain cases as evidence of the structural efficiency of the hull. However, the inspector must perform sufficient examinations and tests of the hull structure at the inspection for certification to determine that the condition of the hull is suitable for the service in which the vessel is to be employed and is in such condition that the vessel may be navigated safely. Additionally, all protected and unprotected salt water ballast tanks shall be inspected at least every four years. Appropriate entries shall be made on the Vessel Inspection Record (Form CG-2832) regarding which tanks have been examined.

The inspector shall ensure that the regulations regarding watertightness and/or weathertightness of the hull, including weather decks, are strictly enforced. Particular attention shall be given to closures, securing devices, gaskets, means of attachment, etc.

30-6-25B. INSPECTION STANDARDS

Standards for the inspection of hulls are found in the following regulations:

- Passenger Vessels (H) - 46 CFR 71.15-1;
- Cargo & Miscellaneous Vessels (I) - 46 CFR 91.15-1;
- Tank Vessels (T) - 46 CFR 31.10-1;
- Small Passenger Vessels (T) - 46 CFR 176.25-1;
- Nautical School Ships (Public) (R) - 46 CFR 167.15-25;
- Nautical School Ships (Civilian) (R) - 46 CFR 168.05-5;
- Oceanographic Vessels (U) - 46 CFR 189.15-1.

In addition to these standards, certain vessels of 150 G.T. or over in ocean, coastwise, and Great Lakes service are required to meet the requirements of 46 CFR, Subchapter E (Load Lines), with respect to strength, closure of openings, protection of openings, guardrails, freeing ports, means of access, etc. Inspections for compliance with these regulations are made by ABS or other such assigning authority approved by the Commandant. A current Load Line Certificate shall normally be accepted by the inspector as evidence that the vessel meets the requirements of Subchapter E. When it comes to the attention of the inspector that a vessel holding a current Load Line Certificate does not comply with the regulations, or that the condition of any fitting covered by such regulations is not satisfactory, the OCMI shall be informed. It is stressed that load line assignments are made by the authorized agency, while the enforcement of load lines within U.S. jurisdiction rests solely with the Coast Guard.

30-6-25C. BULKHEAD PENETRATIONS

The use of epoxy resin as a pipe seal at watertight bulkheads is considered satisfactory when the maximum piping temperature does not exceed 200°F, and when structural fire-retardant qualities are not required by the regulations. It is considered that its use should be limited accordingly, in the case of passenger vessels, to vessels of less than 100 G.T. It would appear that it may be possible to design this type of seal so as to provide adequate fire-retardant properties. However, acceptance for compliance with the requirements of 46 CFR 72 (Construction and Arrangement) would be subject to satisfactory completion of the appropriate standard fire test.

30-6-30. MACHINERY INSPECTIONS

30-6-30A. GENERAL

At each inspection for certification, the inspector shall examine the machinery as required by law and regulations. Inspections and tests shall be performed to ensure that the main and auxiliary machinery, boilers and their appurtenances, and other equipment are in satisfactory operating condition and fit for the service for which they are intended. Special attention shall be given to correcting conditions which are hazardous to personnel. To this end, the inspector shall ensure that gears, couplings, flywheels, and all machinery capable of injuring personnel are provided with adequate covers or guards and that all protective devices are being adequately maintained. In this regard, particular attention shall be paid to guards which will prevent personnel from coming into contact with dangerous electric currents. The chief engineer or other ship's officer in charge of the machinery shall always be asked whether there are any defects or imperfections in the equipment, boilers, or machinery of the vessel.

When practicable, on vessels which are not classed by a recognized classification society, the inspector shall require and observe an operational test on all machinery, both main and auxiliary, sufficient to determine if its condition is satisfactory. The inspector may require an operational test of any machinery when necessary to determine its condition. The inspector should keep safety requirements foremost in mind in the inspection of engineering equipment. The regulations contained in 46 CFR 50-64 (Subchapter F - Marine Engineering) and the instructions in this manual are not intended to cover all contingencies which may be encountered during the inspection of a vessel for certification, and the inspector may require all reasonable tests or inspections deemed necessary to ensure the safety of the vessel. It is incumbent upon the inspector to be alert to unsafe conditions and to require corrective measures before these conditions can cause casualties.

30-6-30B. REFERENCES TO REGULATIONS

The Marine Engineering Regulations (46 CFR, Subchapter F) and the Electrical Engineering Regulations (46 CFR, Subchapter J) contain the primary standards for the inspection of main and auxiliary machinery installations on all vessels except small passenger vessels. As indicated in 46 CFR 58.01-5, these standards are supplemented by the standards of ABS. Subchapter F regulations apply to small passenger vessels inspected under Subchapter T (Small Passenger Vessels (under 100 GT)) only insofar as they are made applicable by 46 CFR 182, which contains the standards for inspection of machinery installations on small passenger vessels.

As provided in 46 CFR 167.25, boilers and pressure vessels and their piping and appurtenances on public nautical school ships shall conform with Subchapter F, or U.S. Navy or Coast Guard Standard Construction Specifications.

30-6-30C. HAZARDOUS CONDITIONS

30-6-30C(1). Boiler Torch Pots. Torch pots should be secured in a vertical position, not at an angle. This is necessary to prevent accidents by the splashing of the combustible liquid from the torch pot onto fireroom personnel. Low flash point liquids should never be used in torch pots, and fireroom personnel should be instructed as to the dangers in the use of any highly combustible liquid having a flash point lower than that of commercial kerosene for moistening the torch.

30-6-30C(2). Gratings. A hazardous condition exists in some machinery spaces where gratings have not been installed over the top of the main condensers to provide safe platforms for oiling the intermediate pressure links, for adjusting the cutoffs, and for access to the indicator cocks. A grating with handrails over the main condenser shall be required. This installation ensures the safety of engineroom personnel during the performance of their duties and the requirements for such installations comes within the intent of 46 CFR 32.01-15 and 58.01-20.

30-6-30C(3). Fuel Oil in Bilges. At annual inspections, the inspector shall examine the bilges and tank tops beneath the boilers, as well as in any compartment in which oil-burning equipment or fuel tanks are installed, to ensure that there are no dangerous accumulations of fuel oil which constitute a fire hazard.

30-6-30C(4). Sparks and Stack Fires. Stack fires and sparks from stack or exhaust pipes, caused by unconsumed particles of soot which cling to the back connections and uptakes of steam vessels or exhaust manifolds of internal combustion engines, can set fire to a vessel. These soot and carbon accumulations are generally dislodged and float out the stack when the rate of combustion is changed; for example, when the ship is slowed down or speeded up or when burners are changed in routine cleaning operations. As a precaution against an occurrence of this nature, it is necessary to keep burners, tubes, uptakes, exhaust manifolds, and stacks clean. Efficient combustion, which reduces the likelihood of carbon deposits, depends in a large measure upon the skill and attention to duty of the engineering force. Tubes, uptakes, stacks, etc., should be kept clean by blowing, brushing, or scraping.

The attention of ship owners, masters, chief engineers, etc., should be drawn to the hazards of stack sparking and fires, to ensure that every precaution will be taken to prevent such conditions. Emphasis should be placed upon the possibility that inattention to this condition may contribute to fire.

30-6-35. INSPECTION OF BOILERS

30-6-35A. GENERAL

Marine boilers can be classified by two general types: firetube or "tank" boilers and watertube boilers. The most common firetube boiler design is that of the familiar "Scotch" type. This design is still in use on Great Lakes and river vessels, and on harbor tugs in some areas. Firetube boilers are usually found on pile-driving barges, steam dredges, OCS platforms, and older vessels propelled by reciprocating engines with very simple boiler feed systems; some are coal-fired. Feed water control is primitive at best and generally no provision is made for keeping dissolved oxygen out of the boiler water. These boilers are particularly vulnerable to thinning of the plating, tubes, and staybolts by corrosion. This condition is often seen in the form of pitting, attributed to dissolved oxygen or the use of corrosive boiler water. In Scotch type boilers, it is commonly found on the outside of the tubes and the shell and head plating near the water line, the combustion chamber top plating, the furnaces, and the bottom shell plating. The numerous highly-stressed riveted joints in firetube boilers are prone to attack by stress corrosion cracking, generally resulting from the deposit of corrosive solids contained in the boiler water.

Watertube boilers are generally designed for operation at considerably higher pressures and steam temperatures than those of the firetube type. Tube metal temperatures are also higher, and scale deposits on heating surfaces, which can be tolerated in firetube boilers operated at lower pressures, are unacceptable in watertube boilers. For these reasons, only distilled water is used for boiler feed and close regulation of the feed water chemistry is essential to prevent pitting of the boiler metal and to reduce scale deposits to a minimum. In contrast to firetube boilers, the pressure containing parts of watertube boilers are of simple design, free from complicated riveted seams and stayed surfaces. The frequency of repair rate is considerably lower and repairs, when they are necessary, involve such operations as tube renewals, refractory and insulation repairs and renewals, and boiler casing maintenance. Watertube boilers, however, are considerably more sensitive to improper operation and inadequate maintenance than are firetube boilers. Tube metal temperatures are normally so high that even a thin scale deposit on the tube interior seriously impairs heat transfer, and tube failure may occur. Cleanliness of the fireside of these boilers is equally important to prevent loss of metal from corrosive elements such as sulphur and vanadium in the fuel. Economizers and air heaters located in the gas passages must be kept clear of soot deposits to reduce the hazard of fire in these elements.

30-6-35B. HYDROSTATIC TESTS AND INSPECTIONS

30-6-35B(1). Firetube Boilers. Subchapter F specifies that hydrostatic tests must be applied to firetube boilers at least annually. The hydrostatic pressure should be maintained at 1.5 times the maximum allowable working pressure (MAWP) for credit throughout the inspection of the fireside. The inspection routine will vary according to the type of firetube boiler to be inspected. When repairs are necessary, the methods employed, materials, and workmanship shall comply with the regulations contained in 46 CFR 59.

The interior of the furnaces and combustion chambers should be examined first. Furnaces and flues should be checked for distortion by measuring with a tram bar. When corrugated or plain furnaces or flues are distorted and no longer in a true circular shape, they shall either be repaired as required by 46 CFR 59.15-1(a) or the boiler pressure shall be reduced as required by 46 CFR 59.15-1(c). Combustion chamber wrapper plates and back plates should be hammer-tested, and areas suspected of being thin should be drilled and gauged. Broken combustion chamber stays will generally be indicated by leakage from the drilled telltale holes. The combustion chamber back plate should be checked for evidence of bulging of the plating between the staybolts. Riveted wrapper plate seams and the furnace connection to the combustion chamber should be checked for leakage. The back tube plate should be carefully examined since leakage in this area, which cannot be corrected by rolling tubes, is sometimes due to cracks in the ligaments between tube holes.

The front tube sheet should be examined next. This is an area which is particularly susceptible to corrosion from leaking tubes and to erosion caused by the use of saturated steam for soot blowing. Leaking tubes should be made tight by rolling or replaced.

The exterior of the boiler shell and heads should be examined next. The entire lagging of the shell and heads is not normally taken off during annual inspections; however, all portable sections should be removed while the hydrostatic pressure is maintained. Wherever moisture appears, sufficient lagging should always be removed to determine its source, which may be leaking seams, broken staybolts, or defective boiler mounting gaskets. The plating in way of the boiler mountings should be examined for evidence of wastage due to leakage from valves and fittings. Leakage from the bottom of the front and back heads in way of the flanging of the plate should be noted for further examination of the inside of the head; cracks induced by flexing of the head sometimes penetrate the plating. Riveted seams showing evidence of leakage should be carefully examined; cracks occasionally occur between rivet holes or extend from rivet holes to the plate edge. The manhole gasket seats and adjacent plating should be checked for signs of wastage due to gasket leakage; the radial clearance between the manhole plate and the head should not be excessive. The boiler saddles, foundations, and collision chocks should be hammertested to detect evidence of deterioration; these members are subject to severe wastage from the corrosive action of bilge water. The hydrostatic pressure should then be released and the boiler drained out.

The inspection of the waterside of the boiler is most conveniently begun by entering through the top manhole. The dry pipe, internal feed lines, and surface blow pipe should be examined first; defective gaskets at the point of attachment of the internal feed lines to the boiler head are frequently the source of erosion of the plating. The butt strap and the rivets attaching the heads to the shell should be sounded with a hammer. Where rivets are found to be loose or rivet heads missing, the rivet holes should be searched for cracks, by nondestructive testing methods, after the rivets are removed. The stay rods, girder stays, and combustion chamber tops should be examined for evidence of wastage due to corrosion. The screw stays at the back and sides of the combustion chambers are difficult to examine because of close clearances; however, a fairly good evaluation of the condition of these members can be made with the assistance of a portable electric light lowered successively between the rows of stays. The most common deficiency found in these stays is "necking", a reduction in diameter near the plate surface caused by corrosion and stresses from expansion of the combustion chamber. The boiler tubes are so closely spaced that visual inspection must usually be confined to the top and side rows. Pitting is frequently seen in these tubes. Shallow, widely scattered pits can usually be disregarded; but deep pits extending over a large area may so reduce the wall thickness that replacement of tubes is necessary. From the standpoint of stress, tubes will satisfactorily function with a reduction of wall thickness of up to 50%. In any event, when evaluating the condition of boiler tubes, a distinction must be made between plain tubes and stay tubes, the latter having a much greater initial wall thickness.

The lower part of the interior of the boiler is inspected next. The most common defects in this area are corrosion of the plating of combustion chambers, furnaces, shell, and heads in the form of pitting and grooving of the flanged plating of the heads and furnaces. Pitting often attacks the plating of the furnaces, combustion chamber wrapper plates, back plates, and the bottom plating of the boiler shell. Grooving, due to thermal stresses, is frequently seen in the flanges of the front and back heads, and at the connections of the furnaces to the combustion chambers. Radial grooving, originating in the holes drilled in the front and back heads for the stay rods and extending in a "spider-web" form from these holes, is occasionally encountered.

30-6-35B(2). Watertube Boilers. Watertube boilers may be considered in two general types: sectional header designs, which are characterized by predominantly straight tubes, and so-called "D" types, in which the tubes are bent to sufficient radius to permit normal entry into the steam and water drums. Forced circulation boilers and steam generators of the once-through type have not found general acceptance in marine practice.

Hydrostatic pressure tests are applied annually to passenger vessel boilers, and at four-year intervals to the boilers of other vessels. Following repairs and at the conclusion of the inspection, watertube boilers should always be hydrostatically tested for credit to a minimum of 1.25 MAWP or, if sustantial modifications or repairs have been made, to 1.5 MAWP, at the discretion of the marine inspector.

The inspection is most conveniently begun inside the furnace. The waterwall tubes and screen tubes should be sighted with a spotlight for evidence of blistering or distortion. Blistered tubes should be renewed; however, a minor amount of tube distortion is acceptable if the insides of the tubes are clean. If there is evidence of tube leakage at the ends of the waterwall tubes, sufficient refractory should be removed to expose the waterwall headers so that the leakage can be traced to its source. The superheater and part of its support structure can generally be seen from inside the furnace. In this area burned support brackets and badly warped superheater elements are common defects. The baffles above and below the superheater in "D" type boilers should be examined. Some boilers of this type are fitted with feeder tubes in the furnace floor which can be examined only when the brickwork is removed. Defects in these tubes, however, are rarely encountered; the furnace floor should be disturbed only when leakage is suspected or for refractory repairs.

Furnace refractory is subject to damage by erosion due to direct flame impingement, fusion occurring at high rates of combustion, and destruction of insulation due to improper drainage during water-washing operations. When the damage is local, the defective area may be repaired; however, it is sometimes necessary to rebuild the walls or floor.

The inspector should continue with an exterior examination. The tubes and headers of economizers and gas air heaters are vulnerable to external corrosion due to condensation and should be examined through the access openings. The steam drum and its accessories should be carefully checked; if a hydrostatic pressure test is applied, the nozzles, gaskets, and welded pipe connections should be searched for leakage. In "D" type boilers, the sliding feet which permit linear expansion of the water drum should be examined. Expansion of the generating tubes of straight-tube boilers is accommodated by bolting the front headers rigidly and securing the back headers with loosely fitted bolts; the condition of these bolts should be checked. In sectional header boilers, the riser tubes, drum nipples, and the top row of generating tubes can be reached for examination from the access opening below the steam drum. Removal of the superheater access doors in "D" type boilers will permit access to the superheater and the lower part of the steam drum. In both boiler designs, the casing in way of the steam drum should receive attention; gas leakage in this area is common. The casing below the steam drum should be sighted; burning or bulging of this casing or distortion of access door frames is usually due to destruction of the insulation. If these conditions are found, the buckled casing must be removed so that the insulation can be replaced.

The headers of straight-tube boilers should be examined. Leaking handhole plates should be marked for later removal and renewal of gaskets. The gasket surface should be examined with the aid of a mirror; chronic leakage is sometimes due to steam cuts across the seating surface. The handhole plates of superheater headers should be similarly examined and the superheater tubes checked for leakage where these tubes are rolled in the headers. The short nipple connections of the transverse mud drum to the front headers and the bottom blow valve connection to this header should be checked for leakage; external corrosion of the nipples is sometimes encountered. The tube joints, handhole plates, and drain nipples of the waterwall headers should be checked for evidence of leakage and external corrosion. The air duct beneath the furnace floor should be examined to ensure that it is free from accumulation of oil.

The superheater headers and waterwall headers of "D"-type boilers should be similarly examined. The vestibule below the economizer or air heater should be opened and cleaned. In this area, the ends of the generating tubes, at the connections to the bottom drum, can be seen. Because of the close spacing of the tubes, inspection is usually limited to the outer rows; however, external corrosion of these tubes, due to soot deposits and improper water-washing, is not uncommon. The bottom drum manhole opening, bottom blow valve connection, and drum support saddles should be examined. In this area, leakage and associated wastage are rarely seen; however, the foundations of boilers installed directly on the tank tops are subject to wastage from the corrosive action of bilge water.

The interior of the steam drum is the best starting point for the inspection of the water side of the boiler. The flanged piping connections of the desuperheater and internal feed lines should be hammer-tested; if the tightness of the desuperheater piping is doubtful, it should be hydrostatically tested. The steam drum should be thoroughly cleaned prior to inspection; portions of the drum internal platform should be removed to permit a close examination of the drum interior and the tube ends. Pitting along the waterline, in the bottom of the drum, and in the ends of the riser tubes and generating tubes, is occasionally found. The brackets supporting the dry pipe, internal feed lines, and desuperheater should be examined to ensure that the securing bolts are tight.

A sufficient number of handhole plates should be removed from the headers of the generating tube bank, superheater, economizer, and waterwall tubes to permit a comprehensive examination of these tubes. Generally, removal of five percent of the handhole plates will suffice; however, if internal pitting or an excessive amount of scale is found, it may be necessary to remove all of the handhole plates for a complete examination. Scale deposits exceeding 1/32 inch in thickness will seriously impair heat transfer, especially in screen tubes and waterwall tubes, and may result in blistered and distorted tubes.

Scale should be removed by mechanical means or by chemical washing. Examination of tube interiors is difficult in "D" type boilers because the tube bends preclude sighting more than a short distance inside each tube; however, the tubes should be inspected from within the lower drum and, with the aid of a mirror, from the waterwall and superheater headers. The inside surface of the bottom drum should be examined for evidence of pitting, which is occasionally seen in boilers which have been out of service for long periods of time.

30-6-35C. BOILER REPAIRS

30-6-35C(1). General. It is difficult to describe all of the many types of repair procedures which the inspector may have to consider. Boiler defects will seldom involve only certain specific areas. For example, severely pitted tubes will often be accompanied by pitting in headers or in steam and water drums. Similarly, a distorted corrugated furnace frequently leads to the discovery of wastage of combustion chamber plates or adjoining furnaces. Repairs, whenever they are undertaken, must comply with the regulations in 46 CFR 59.

30-6-35C(2). Firetube Boilers. In firetube boilers, visual inspection of the outside of the tubes is limited to the outer rows, because of close tube spacing. Heavy scale buildup on these tubes is common, and thorough cleaning of the tubes, even by chemical means, is very difficult. In addition to pitting on the waterside, these tubes are subject to wastage of that part of the tube which projects beyond the tube sheet, particularly in the smoke box area. This condition is easily detected. When it is found, the defective tubes should be renewed. On the other hand, thinning of the tube walls due to corrosion can usually be discovered only by cutting out and sectioning tubes. This procedure should be followed only when a substantial number of the tubes is found to be leaking or plugged. In general, when tubes look satisfactory on the waterside, when the boiler has no history of tube failure, and when leakage can be corrected by re-rolling, the tubes may be kept in service. Tubes from which the beading has been burned off should not be built up by welding; they must be renewed (see plates 30-6-35C(2).1 through .3 for examples of defects and repairs to firetube boilers).

30-6-35C(3). Watertube Boilers. In watertube boilers, tube replacement is one of the most frequently encountered repair procedures. Boiler tube life is influenced by such factors as original wall thickness, thermal stresses due to location within the boiler, waterside corrosion, fireside damage, and service history of the boiler. The external surfaces of tubes are exposed to loss of metal from corrosion and attack from sulphur and vanadium in the oil burned, as well as overheating and slag damage. Deterioration of this type may result in abnormal bends, bulges, blisters, ruptures, and mechanical fatigue cracks which are fairly obvious during visual inspection of the firesides. The following procedures are recommended for inspection of boiler tubes:

(a) Conduct a detailed and thorough visual inspection of all uncovered tubes. In general, when tubes look satisfactory from a visual inspection, nothing need be done and tubes may be kept in service until some degree of failure is encountered. Not until the same type of tube failure occurs often need a major tube replacement be considered. A number of failed tubes may be plugged in an operating boiler, generally not exceeding 10% of the tubes in any one tube bank. Downcomer or riser tubes which are defective should be replaced;

(b) If there is a suspicion that deep corrosion product scabs exist in waterside pits or if any other condition prevents minimum thickness determination, then chemical cleaning to bare metal should be required. If this process shows pits in a large number of tubes, and more than one or two in many tubes, a sample tube should be cut out of the boiler and sectioned and its minimum thickness determined;

(c) If the sample tube has deteriorated (generally to less than 50% of the original thickness), a number of representative tubes (20-30) should be cut out of the tube bank and the process repeated. If more than half of the sample tubes are found to be in the same general condition of deterioration, consideration should be given to re-tubing the boiler.

30-6-35D. INSPECTION OF BOILER MOUNTINGS

30-6-35D(1). Boiler Stop Valves. The inspector shall require all valves on boilers to be opened up periodically as required by the regulations, or when there is evidence of defects or malfunctioning of the valves. A thorough examination of the internal and external parts of the valves shall be made.

When flanged valves are removed from the boiler pads, the condition of the studs or bolts which connect the valves to the pads shall be determined. When valves are bolted to pads or stools which are riveted or welded to the boiler, the riveted or welded joints should not be broken unless there is evidence of leakage or deterioration. These examinations may also be made at intermediate periods if there is any evidence that defects have developed or that excessive corrosion has occurred. When one or more flanged joints intervene between a stop valve and the boiler drum or superheater outlet, such flanged joints need not be opened at the time the valve is removed from its flanged joint. A flanged joint may be opened at any time by the inspector if, in his opinion, an examination is considered necessary.

A record of the inspection of the valves shall be made on Form CG-840B (Boiler Inspection Book-Condition of Vessel) and a notation shall be made on the Certificate of Inspection. This notation shall be carried on each succeeding certificate until the next examination.

30-6-35D(2). Boiler Safety Valves. The inspector shall observe the lifting and reseating pressures of the boiler safety valves and examine the valves to determine if there are any signs of weakness or malfunctioning of the safety valves. Whenever evidence of leakage appears, the inspector may require the safety valves to be opened at intermediate periods for examination.

The inspector shall carefully check the setting of each boiler drum and superheater safety valve and require any adjustments necessary to maintain the boiler within MAWP. When the boiler safety valves have been proved satisfactory, each drum safety valve (and superheater safety valve, when the latter provides part of the required relieving capacity for the boiler) shall be sealed and stamped with the official seal of the Coast Guard.

The safety valve escape piping shall be examined for freedom of expansion and proper drainage. The inspector shall also ascertain, at the time the safety valves are tested, that the drain opening in the valve body and the escape piping are free. Improper drainage or plugged drains may result in serious corrosion of the valve body and internal parts. The inspector shall examine the boiler casings to ascertain that there is no accumulation of soot, ash, scale, etc. which may drop into the escape piping and cause malfunctioning of the safety valve. The inspector may require the discharge connections to be removed in order to determine the freedom of discharge from the safety valves.

30-6-35D(3). Cast Iron Valves. See paragraph 30-6-35G(3) for a discussion of cast iron valves used for boiler mountings.

30-6-35D(4). Water Columns, Test Cocks, and Gauges. The water columns and gauge glasses shall be carefully examined at each annual inspection. It is necessary to ascertain that water cannot accumulate in the pipe forming the steam connection to the water column. The connections to the boiler should be free, as indicated by the action of the water in the glass. The water columns and gauge glasses shall be blown down on each boiler to determine the freedom of the connections to the boiler and to see that the blow-off piping from the water columns and gauge glasses are free. The operating condition of the gauge cocks shall be determined by test. All steam gauges on the boilers and main steam lines shall be checked for accuracy with a standard test gauge.

30-6-35E. INSPECTION PROCEDURES FOR EXTERNALLY FIRED LAP SEAM BOILERS

30-6-35E(1). Before Inspections. Before inspection, all lagging or other material covering longitudinal lap joints is to be removed on the entire length of the seam to a width of at least four inches from the nearest course of rivets, after which the seam is to be thoroughly scaled and wire-brushed outside and also inside, if possible. All deposits of electric welding, whether on rivets or plates, are to be entirely removed. The joints should then be thoroughly examined for indications of grooving or other defects. Grooving in the initial stages is characterized by a line of irregular surface cracks extending along the caulking edges or running parallel with the line of rivets and is particularly noticeable on the water side. When grooving is evident, steps should be taken to ascertain its depth and extent so that a lower working pressure may be calculated based on the premise that the groove exceeds the maximum measureable depth by ten percent.

30-6-35E(2). During Inspections. During inspection and while the boilers are under full hydrostatic stress, the exposed seams are to be shock-tested over their entire length by striking the plates in the vicinity of the rivets with a smooth-headed hammer weighing at least seven pounds. Should this procedure reveal a leak, however slight, in the solid plate, it is evident that a crack is present, in which case the lap seam must be cut away and butt straps installed or the shell plate renewed.

30-6-35E(3). Fusion Welding. Fusion welding for any purpose or to any degree must not be applied or allowed to remain on either rivets or solid plate forming a longitudinal lap joint. Should leaks develop as a result of slack seams or rivets, repairs should be effected by renewing sufficient rivets to obtain a tight caulked joint. Rivet removals, when necessary, should be done by chipping off the heads and driving out the shank, but never by burning. In every case where rivets are removed, appropriate nondestructive testing (NDT) should be used to detect the presence of cracks. Seams found to be satisfactory may be relagged or otherwise covered in such a manner that the covering can be easily removed intact at subsequent inspections or examinations.

30-6-35E(4). Departures. Should a departure from these methods of repair become necessary, full details shall be transmitted to Commandant (G-MVI) for review before any alternative action is taken. A separate entry shall be made on Form CG-840B in each case indicating that the foregoing procedures have been carried out. A statement of the conditions found and the nature and extent of repairs, if any, shall be included.

30-6-35E(5). Reports. Commandant (G-MVI) shall be furnished with a detailed report, including photographs if obtainable, in each case where defective seams are detected.

30-6-35F. REMOVAL OF BOILER MOUNTINGS AND ATTACHMENTS ON HIGH-PRESSURE BOILERS

The requirement to remove boiler mountings at eight-year intervals has been modified for certain vessels having unusually high steam pressures. This modification has been permitted due to the difficulty of attaining a steam-tight joint and the fact that some of the valves are welded directly to the steam piping.

For these vessels, it will only be required that the bonnets of the valves be removed to permit the inspection required at eight-year intervals. The valves, mountings, and attachments need not be removed from the boiler unless defects are found which require such removal for further examination, repair, or replacement. Credit shall be given for an eightyear boiler mounting inspection for these vessels if the boiler valve bonnets are opened and the inspector is satisfied with the examination. A mirror shall be used to check all inaccessible parts of the mountings.

30-6-35G. LESSONS LEARNED ABOUT BOILERS

30-6-35G(1). Explosions of Fire Tube Boilers. The boiler explosion on the tug Captain C. Mathiasen resulted in the loss of the vessel and the death of a crewmember. This casualty illustrates the importance of thorough boiler inspections. The boiler on this towboat was a Scotch-type built in 1919, having three furnaces connected to a common combustion chamber.

The explosion appears to have been caused by a reduction in the thickness of the metal forming the combustion chamber, which resulted in the pulling away of the bottom part of the wrapper sheet from the stay bolts, followed by a fracture of the flame sheet in the knuckle at the lower edge; the flame sheet flange remained riveted to the wrapper sheet. The examination of these parts of the boiler, after the casualty occurred, indicated pitting on the water side of the wrapper sheet and considerable thinning of the metal in both the wrapper and flame sheets.

Records indicated that the boiler had been regularly inspected five months prior to the explosion, at which time a hydrostatic pressure of 1.5 times the working pressure was applied and the usual hammer tests were made to all accessible parts on both the fireside and the waterside of the boiler. From the facts developed during the investigation into this casualty, it is apparent that a weakened condition of the flanged plate, forming part of the combustion chamber, escaped detection during the annual inspection. It is evident that hydrostatic and hammer tests alone are not sufficient to establish the integrity of a boiler for continued service. Defects which show up under hydrostatic tests can easily be observed from the outside or fireside of conventional boilers. Defects which often are the most serious, however, are indicated only by the surface condition of the plates or other parts seen from the water or steam-side. Some of these interior defects are:

(a) Grooving which is usually found along the edge of lapped plates;

(b) Fatigue cracking which occurs on the knuckles of flanged plates and on the under side of the first corrugation forming the horse collar of Morison-type furnaces;

(c) General deterioration of plates and stays caused by corrosion which is often concealed by a layer scale having considerable thickness. The extent to which these defects have advanced can be determined only by a most careful examination after the boiler has been thoroughly scaled and cleaned.

30-6-35G(2). Superheater Erosion. At the annual inspection of a P-2 vessel in 1953, it was discovered that serious pitting or erosion in superheater headers of certain boilers built by Combustion-Engineering Superheater, Inc., had occurred. This condition was evidently caused by the improper location of the drain hole, which created an eddying effect in the steam. While this pitting was not found in boilers built by other manufacturers, it is felt that this condition may exist or arise under normal operating conditions.

In a reported casualty, the superheater header of a D-type boiler on a C-3 vessel was found to be leaking while attempting a hydrostatic test of the boiler. Examination revealed a slot approximately 3/16" wide by 5/8" long in line with the baffle drain hole between the second tube and the back knuckle above the baffle. Closer inspection disclosed a seriously grooved area apparently caused by erosion extending 8" above the baffle, tapering from the holed area to the original thickness of 7/8". During the examination it was noted that with the handhold plates removed it was impossible to obtain visual examination of the header in the area surrounding the baffle plate.

The inspector shall, when conducting inspections on boilers of the type having superheater headers installed vertically or nearly vertically, use all means available to determine if there is grooving or pitting of the header in the area of the baffle. This examination shall include the use of mirrors and finger touch, as necessary, to determine the condition. If serious pitting or erosion is found in superheater headers installed vertically or nearly vertically in boilers, it is recommended that the drain holes be relocated in the baffle near the center thereof and welded repairs be made if necessary. Whenever pitting or erosion is noted, necessary repairs should be effected to prevent a potential boiler casualty.

30-6-35G(3). Cast Iron and Malleable Iron Valves. Failures of cast-iron valves attached to boilers and used in main and auxiliary steam feed and blow-off lines, installed prior to 1 July 1935, have resulted in a number of serious casualties and, in some cases, loss of life. In view of the thinning down of cast-iron valve bodies due to corrosion and wear, with consequent decrease in the factor of safety, cast iron valves and fittings used as boiler mountings and in main and auxiliary steam feed and blow-off lines should be subjected to a thorough examination, particularly at the time of the annual inspection.

Since the brittle properties of cast iron may produce fractures under conditions of shock and sudden application of load, such as water hammer and rapid changes in temperature, valves and fittings of cast iron should be carefully and thoroughly examined for cracks and corrosion defects at the time of inspection. At the end of the four-year period when boiler mountings are opened, and at the end of the eightyear period when they are removed for examination in accordance with 46 CFR 61.05-15, cast-iron valves and fittings should be subjected to a thorough visual inspection, both internally and externally. The valve bodies should be inspected to ascertain whether there has been any reduction in wall thickness below the minimum requirements for cast iron valves and fittings as specified in 46 CFR 56.60-10. If it is found that the thickness of the material falls below the minimum requirements specified, such valves and fittings should be removed from service.

Special consideration should be given to installations where cast iron valves and fittings have been repaired or have had parts replaced or altered. The bodies of cast iron valves and fittings should not be tapped for drainage or bypass connections, etc., except when a boss has been cast integral with the valve. Inasmuch as cast iron and Grade B malleable iron have somewhat similar properties, valves of this latter material should receive the same thorough inspection as required for cast iron.

30-6-40. INSPECTION OF MAIN PROPULSION MACHINERY

30-6-40A. GENERAL

At the inspection for certification, the inspector shall be generally guided by subpart 30-6-30 in the inspection of main propulsion machinery.

30-6-40B. TURBINES

30-6-40B(1). Overspeed and Low-Oil Pressure Trips on Turbines. The inspector shall determine at each inspection, by whatever practical means may exist, that the overspeed mechanisms, low-oil pressure shutdown devices, turbine governor mechanisms, and throttle valves and linkages are in proper operating condition. When possible, the inspector shall require operational tests to check these devices or mechanisms. Any operational tests of low oil pressure shutdown devices shall exclude those which require the shutting-off of the oil supply to the oil pump. Any malfunction of the foregoing items shall be corrected.

30-6-40B(2). Overspeed and Low-Oil Pressure Trips on Turbo-Electric Drive Vessels. Automatic speed control gear on propulsion turbines of turbo-electric drive vessels shall be checked at each inspection. The efficient operation of these controls shall be actually demonstrated. Particular attention shall be paid to the freedom of movement of overspeed trips and low-oil pressure trips.

30-6-40C. MAIN ENGINE GRAVITY-TYPE LUBRICATING SYSTEMS

In a reported casualty, the propulsion turbines of a C3- S-A2 class vessel sustained extensive damage due to insufficient lubricating oil. Investigation revealed that a closed or partially closed valve in the piping system from the gravity tanks to the main engine caused a reduced flow of oil to the turbines. This valve was marked "L. O. GRAVITY TANKS TO GEAR BOX" and was located approximately 15 feet from the starboard gravity oil tank. The valve was not included in the original approved plans of the piping system and, since it was added to the shutoff valves at the tanks, there was no justification for its being in the system. Because of the possibility that a similar condition may exist on other vessels, whereby the main engines could be inadvertently damaged, the following action shall be taken:

(1) During the inspection or reinspection of vessels having gravity lubrication, the discharge piping from the gravity tanks shall be examined;

(2) If shutoff valves are found which are in addition to those at the gravity tanks and unnecessary to the system, they shall be secured in the open position or completely removed when possible.

30-6-45. INSPECTION OF AUXILIARY MACHINERY AND EQUIPMENT

30-6-45A. GENERAL

The tests and inspections of auxiliary machinery and its associated equipment are covered in 46 CFR, Subchapters F (Marine Engineering), J (Electrical Engineering), T (Small Passenger Vessels), and R (Nautical Schools). The instructions in this subpart clarify those situations requiring particular attention.

30-6-45B. TURBINE-DRIVEN AUXILIARY MACHINERY

Overspeed trips and low-oil pressure trips of turbine-driven auxiliary machinery shall be tested at each inspection.

30-6-45C. STEERING GEAR

30-6-45C(1). General. Coast Guard inspection of steering gear systems aboard certificated vessels must be meticulous to reduce vessel casualty risks. The first step in accomplishing this goal is the inspector's recognition of the critical nature of the equipment he is inspecting. The second is the ability to recognize signs of imminent equipment failure, improper equipment operation, and the existence of defective equipment.

46 CFR 58.25 contains the general requirements for steering apparatus for vessels other than small passenger vessels. 46 CFR 111.80-70 contains the requirements for electric-powered steering apparatus installations for vessels other than small passenger vessels. 46 CFR 61.20-1 requires that steering apparatus be tested and inspected at the inspection for certification (including all devices employed in the changeover from automatic to manual operation).

46 CFR 182.30 contains the requirements for steering apparatus for small passenger vessels. The requirement for testing and inspection of this equipment at each inspection for certification is in 46 CFR 176.25-35.

Because proper and reliable operation of the steering apparatus is vital to the safe navigation of a vessel, thorough inspection and testing of each unit incorporated in the steering apparatus is considered mandatory. To ensure that the inspector is completely familiar with the installed equipment, a review of the manufacturer's instruction manual is recommended prior to commencing the inspection and tests. Information such as the proper operating pressures of the hydraulic system and the specific capabilities of the alternate and emergency features can be obtained from this source. It is important that the inspector question the chief engineer as to problems which may have occurred with the steering apparatus. This information may indicate poor reliability trend of that particular equipment or the existence of a class problem.

30-6-45C(2). Inspection Procedures. Prior to conducting operational tests of the steering system, the following inspections should be conducted, keeping in mind that vibration is frequently severe in the steering gear area:

(a) With all power sources secured at the main and emergency distribution switchboards, open and inspect all steering motor starters and switchgear in accordance with the appropriate provisions of 46 CFR 111.05-10. Be particularly alert for loose wiring connections, loose equipment mounting screws, frayed or broken control wiring (especially in way of door hinges), and dirt or debris. Check for free and smooth mechanical operation of start-stop switches and transfer switches;

(b) Sound the mounting bolts for all equipment. Check all attachments related to piping and control linkages for tightness. Inspect control linkages, linkage pins, and ram guides for wear;

(c) Hand rotate each motor and pump assembly, being alert for unusual noise, binding, or a feeling of roughness during rotation. Inspect the overhead above each coupling for evidence of grease slinging; this is a sign of imminent coupling failure or excessive lubrication of the coupling assembly. Check motor end bell ventilation openings for cleanliness. Check hydraulic oil for proper level, cleanliness, and signs of emulsion. Be alert for signs of abnormal oil leakage;

(d) Inspect the steering gear space for loose lighting fixtures, missing light covers, and storage of flammable and combustible materials such as rags, wood, cans of paint, oil, etc. Check for evidence of salt water leakage into the space through both the vent ducting and rudder post packing (if applicable). Salt encrustation in the corners of the space may be the only clue to this problem when the vessel is in port.

30-6-45C(3). Operational Tests. When conducting operational tests, energize the equipment and test the operation of each motor and pump assembly, utilizing both the port and starboard control cables. Operate a motor and pump assembly from the bridge control station, secondary control station, and local control station through the full range of rudder travel. Operate a motor and pump assembly on the normal, alternate, and emergency power supplies, checking for the proper operation of the manual and automatic bus transfers during this procedure. Require operation of the emergency hand pump to swing the rudder both port and starboard from amidships (it is unnecessary to require full rudder swing utilizing this system). Verify that the synchro-steering repeaters on the bridge, secondary control, and steering gear room are in alignment with each other and with the mechanical rudder angle indicator. Verify that all indicating lights, the feeder circuit open alarm, and the emergency lighting in the steering gear room operate properly. Test for proper operation of all voice communication systems among the bridge, secondary control, and steering gear room. Check for properly posted operating instructions and that the instructions are, in fact, accurate and usable. During operation of the steering apparatus, be alert for unusual noise, vibration, oil leakage, and abnormal hydraulic pressures. Check for erratic or jerky movement of the rudder, follow-up system, or synchro-repeater system. If underway, check for normal operation under load, with special attention to overheating of the operating motor and pump assembly.

30-6-45C(4). Dual Electric-Hydraulic Types. Each of the following three systems is deemed to be of the dual electric-hydraulic type:

(a) Any system comprising two hydraulic pumps, driven by separate electric motors, with separate branch circuits;

(b) A system comprising two hydraulic pumps, driven by separate electric motors, with separate branch circuits, in which both motors can be run at the same time (although only one can be used to operate the steering gear at a time);

(c) A system comprising two hydraulic pumps, driven by separate electric motors, with separate branch circuits, in which both units can operate on the steering gear at the same time.

Dual rams (meaning a double-acting hydraulic ram, including its cylinders) are not required under 46 CFR 58.25-25(a) for "dual power hydraulic type" steering gear provided the ram, connecting rod, cross-head, and quadrant are designed for strength in excess of the rudder stock.

30-6-50. INSPECTION OF PIPING SYSTEMS

30-6-50A. GENERAL

At the inspection for certification, the inspector shall be generally guided by subpart 30-6-30 in the inspection of piping systems.

30-6-50B. SAFETY AND RELIEF VALVES

The inspector shall observe that the safety valves (or relief valves) installed on reduced-pressure lines, evaporators, feedwater heaters, etc., operate satisfactorily. These valves shall be subjected to operating tests to determine if they can prevent the build-up of excessive pressures before the shutoff valve can be closed and serve as a warning in the event of failure of the reducing valve. The settling of such valves shall be checked at each inspection for certification and adjusted if necessary.

30-6-50C. INTERNAL BILGE SUCTION VALVES

Internal valves are required to be installed on bilge suction lines on passenger vessels by 46 CFR 56.50-50. They are not required on cargo or tank vessels, but are fitted in many instances as an additional safety measure. When fitted, they should be kept in good operating condition. These valves often consist of screw-down valves which, in many instances, become frozen in the open position. In some casualties, where vessels have been in collisions or groundings, damage could have been greatly minimized if the proper precautions and maintenance had been taken with internal valves. The damage suffered in these casualties should have been confined to one watertight compartment, but because internal valves had been left open other watertight compartments were flooded. The result was that cargo holds were damaged and personnel endangered. In some investigations, it was reported that none of the ship's officers knew the purpose of the valves or that they even existed. For these reasons, the inspector shall check such valves and require that they be in an operable condition at the time of inspection, whether or not the valves are required under 46 CFR 56.50-50. The inspector shall also ensure that the ship's officers understand the purpose of these valves.

Should the operator of a cargo vessel equipped with remote control suction valves in bilge suction lines wish to remove these valves or render them permanently inoperable in the open position, he may do so through one of the following procedures:

(1) Remove the remote control rod, operating wheel, and suction valve and replace the valve with a spacer of equivalent size;

(2) Remove the remote control rod, operating wheel, remote control suction valve bonnet, valve disc, body seat ring, and guide bridges and replace the valve bonnet with a steel cover-plate of appropriate size;

(3) Remove the remote control rod, valve stem, and disc and install a screwed plug or bolted gasket and washer over the stuffing box hole to effect a tight valve bonnet.

30-6-50D. STEAM PIPING TO SOOT BLOWERS

In a reported casualty, a 600 psi steam supply line to the soot blower elements ruptured, causing serious injuries to the person who was engaged in blowing tubes. Upon examination of the ruptured pipe it was determined that the rupture occurred in a bend where, due to change of direction of the steam, erosion had, over a period of years, virtually eaten away the pipe from the inside.

Particular attention during periodic inspections should be given to areas where erosion and/or corrosion are likely to occur in soot blower piping. The location of these areas can best be determined from a visual examination of the piping installations on board the vessel.

30-6-50E. CARGO PIPING REPAIRS

Repairs to cargo piping systems are classified as emergency, temporary, or permanent. Emergency repairs are effected to permit the completion of cargo discharge. Temporary or permanent repairs shall be required prior to loading of another cargo.

Temporary repairs are effected to a pit or other isolated defect in a line. Examples of temporary repair methods include substantial pipe clamps, repair sleeves, and similar devices capable of withstanding operating pressures and temperatures. Permanent repairs are effected by an isolated welded doubler or renewal in kind, and are required upon next gas freeing or repair period, whichever is sooner. Generally, piping with a localized, isolated defect and otherwise in good condition only should be repaired with a doubler.

Piping restored to sevice by any of these methods should be appropriately tested upon completion of repairs.

30-6-55. ELECTRICAL INSPECTIONS

30-6-55A. GENERAL

At each inspection for certification, the inspector shall examine the vessel's electrical installation, including electrical equipment and apparatus, as required by law and regulations. The inspection shall ensure that the arrangement of and materials in the installation comply with the applicable laws and regulations and that the operating condition is satisfactory. The primary purposes of the electrical requirements and inspections are to arrive at adequate and reliable shipboard electrical systems, the components of which provide safety to personnel from electrical shock, and to minimize the danger of fire originating within the electrical system.

The scope of the electrical inspection is detailed for small passenger vessels in 46 CFR 176.25-15, and for other vessels in 46 CFR 111.05-10. The inspection includes the examination and testing, when necessary, of all electric generators, motors, wiring circuits, junction boxes, fixtures, and other electric installations.

No electrical repairs or alterations affecting the safety of the vessel, its equipment, and crew shall be made without the knowledge and approval of the OCMI. Drawings must be approved before work is started, unless considered unnecessary by the OCMI. Drawings are not required for repairs that do not include alterations.

See also Chapter 31 of this manual for additional information concerning the inspection of electrical equipment used on vessels.

30-6-55B. REFERENCES

Subchapter J contains the primary standards for the inspection of electrical installations on all vessels except small passenger vessels. As indicated in 46 CFR 110.10, they are supplemented by various recognized specifications, standards, and codes. Subchapter J applies to small passenger vessels inspected under Subchapter T only insofar as they are made applicable by 46 CFR 183, Electrical Installation for Small Passenger Vessels (under 100 G.T.).

Vessels contracted for prior to November 19, 1952 are not, in all respects, subject to the requirements in Subchapter J. These vessels may be maintained in the status quo as long as the electrical installation is in good condition, to the satisfaction of the OCMI, unless amended regulations specifically subject these vessels to the amendments. However, major alterations and major extensions to electrical installations on these vessels shall be made to the same standards as required for new vessels.

Subchapter J regulations are republished in CG-259, Electrical Engineering Regulations.

30-6-55C. INITIAL ELECTRICAL INSPECTIONS

30-6-55C(1). General. When carrying out tests and inspections described in 46 CFR 111.05-10(c), the inspector shall pay particular attention to the items listed in this section of the manual. The specific tests and inspections described are intended as guides to the inspector. These tests and inspections are not mandatory when, in the opinion of the OCMI, they are unnecessary. In general, most, if not all, of these prescribed tests will be conducted by the shipbuilder. They should be observed by an inspector and the recorded data obtained for checking and reference purposes.

30-6-55C(2). Electric Cable. Electric cable shall be checked during installation for size and type as shown on the approved plans. The adequacy of cable supports shall also be checked. It shall be ascertained that no cable is near a pipe or other hot object, and that cables have not been damaged during installation due to excessive pulling forces, sharp bends, sharp or rough edges of cable supports or bulkhead penetrations, or similar abrasions. Cable penetrations required to be watertight shall be checked for proper packing of the terminal or stuffing tubes, including provisions for future takeup of gland units (see 46 CFR 111.60). Cable penetrations through Class A and Class B bulkheads and decks shall be checked for compliance with approved methods.

30-6-55C(3). Insulation Resistance. All electric power and lighting cables and equipment shall be checked for proper insulation to ground and between conductors. The insulation resistance measuring instrument (megger) used should be of the 500 volts direct current type except for cables which are rated less. Insulation resistance varies considerably with humidity, amount of exposed copper, etc. Therefore, it is difficult to establish firm rules to guide the inspector. Generally, plate 30-6-55C(3).1 should be used as a guide in determining minimum permissible values of insulation resistance. Ordinarily, on a dry day and with new clean equipment, the resistance values should not be less than the values indicated.

The test for vital motors and generators shall be made at a direct current potential of 500 volts, if practicable. The insulation resistance in megohms shall be at least equal to the formula in plate 30-6-55C(3).1.

30-6-55C(4). Group Control Panels. When two or more motor controllers are grouped into a motor control center and supplied by a common feeder, the group control panel shall be checked for compliance with the requirements for group control panels in 46 CFR 111.70-25. Each controller and its associated motor overcurrent protective device, motor branch circuit overcurrent protective device, and disconnecting means shall be mounted in a common metal enclosure with a disconnect device to prevent the door being opened when the circuit is energized. Adequate working space should also be provided. This working space generally requires not less than 30 inches in front, while in no case less than 18 inches in the rear, when access to the rear may be necessary.

30-6-55C(5). Generators. Generators shall be checked for general condition (both electrical and mechanical), voltage regulation, parallel operation, operation of safety devices such as reverse-current or reverse-power trips, overcurrent trips, overspeed trips, low oil pressure trips, and similar devices (see 46 CFR 111.10).

30-6-55C(6). Rotating Electric Machinery. Rotating electric machinery shall be checked to ensure that rotating and uninsulated electric parts are adequately shielded from accidental contact by personnel. Nameplate data shall be examined for the correct ratings for the particular application.

30-6-55C(7). Switchboards. Switchboards shall be checked for handrails, guardrails, working spaces, insulating floor coverings, and drip covers. Switchboard enclosures shall be checked for backs and ends. Switchboard-mounted apparatus shall be checked for identifying nameplates. Circuit nameplates shall be compared with the rating or setting of the overcurrent devices and with approved plans. The accessibility of items requiring maintenance or adjustment shall be checked. Meters shall be checked for proper calibration. The operation of automatic switchgear and mechanical interlocks shall be observed (see 46 CFR 111.30).

30-6-55C(8). Panelboards. The rating or setting of the overcurrent devices shall be compared with the values given on the circuit directory and with the approved plans. The accuracy of the directory description of loads served by each circuit shall also be checked (see 46 CFR 111.40).

30-6-55C(9). Motor Starters. Motor starters shall be checked to ensure proper starting of the motor under service conditions with properly rated, motor-running, overcurrent protective devices. Enclosures shall be checked to ensure that they are dripproof or watertight and that required door positioners are installed. A fixed heat-resistant wiring diagram for each motor starter must be on the inside of its enclosure door. Each motor starter not disconnected from all sources of potential when the disconnect switch is opened, due to electrical interlocked circuits necessary for proper operation of the apparatus or for other valid reasons, shall be checked to ensure that attention is directed to these conditions by a warning sign (see 46 CFR 111.70).

30-6-55C(10). Disconnect Switches. The presence and location of disconnect switches required for motor starters, fuses, etc., shall be checked. When a switch, circuit breaker, switchboard, or distribution panel is intended to serve as a motor and controller disconnect switch, the inspector shall ensure that the applicable requirements of Subchapter J have been met (see 46 CFR 111.55 and 111.70).

30-6-55C(11). Accessibility. The accessibility of electric apparatus for inspection and maintenance shall be observed. The accessibility of junction boxes and similar apparatus in way of paneling shall also be noted. Hinged doors of motor starters and similar apparatus shall be checked for interference with adjacent structural parts or apparatus.

30-6-55C(12). General Alarm Systems. The general alarm system shall be checked with a sound level meter, the sound level of the bells being measured in each stateroom with the doors closed. Where the background noise level is questionable, the sound level should be measured while the vessel is underway. For the required sound levels, see 46 CFR 113.25-10(c).

30-6-55C(13). Emergency Loudspeaker Systems. The emergency loudspeaker system shall be checked with a sound level meter, the sound level being measured at each lifeboathandling station, each lifeboat-embarkation station, each passenger assembly station, and throughout the crew's quarters. Where the background noise level is questionable, the sound level should be measured while the vessel is underway. For the required sound levels, see 46 CFR table 113.50. It shall be demonstrated that voice reproduction be highly intelligible. It shall also be demonstrated that the grounding or opening of either conductor or the shorting of both conductors to a typical lifeboat station loudspeaker or to a typical embarkation deck loudspeaker, each to be selected by the inspector, will not reduce the output of any one of the remaining loudspeakers by more than three decibels.

30-6-55C(14). Electric Installations in Hazardous Locations. Electric equipment and wiring in hazardous locations shall be checked for compliance with 46 CFR 111.80-5. Intrinsically safe systems shall be checked to ensure that they are installed in accordance with the plans and instructions required by 46 CFR 110.80-8. All equipment shall also be checked for proper Underwriters' Laboratories, Inc. or Factory Mutual Research Corp. labels.

30-6-55C(15). Steering Gear Circuits. Steering gear circuits shall be checked to ensure that they are separated to meet 46 CFR 111.80-70. Steering gear motor controllers shall also be checked to ensure that they are located in the steering gear room (see 46 CFR 111.80-70(d)).

30-6-55C(16). Emergency Firepump Circuits. Circuits for the emergency firepump(s) shall be checked to ensure that they do not pass through the engineroom or boiler room (see 46 CFR 112.05-5(f)).

30-6-55C(17). Low Voltage Releases. It shall be determined that motor controllers required to have low voltage release by 46 CFR 111.70-20(n) do, in fact, have low voltage release.and that motor controllers prohibited from having low voltage release do, in fact, have low voltage protection. All motors should be run simultaneously and then all generators tripped off the line. One generator should be placed back on the line and it should not trip because of the oncoming load. Motor controllers requiring low voltage release should start their motors automatically. Motor controllers prohibited from having low voltage release should not start their motors automatically. If the motor load exceeds the total ship service generating capacity, the above test should be conducted with all motors that have low voltage release and sufficient motors with low voltage protection to add up to the generating capacity running. A second test shall then be conducted with the remaining motors. None of the motors in this second test should start automatically.

30-6-55C(18). Miscellaneous Electrical Equipment. Sound-powered telephones, electric water lights, daylight signal lights, engine order telegraphs (including power failure alarms), steering gear, rudder angle indicators, voice tubes, fire detecting systems, galley equipment, automated machinery, electric power-operated boat winches, electric whistle timers and contact makers, watertight door controllers, firescreen doors, emergency lighting, exit lights, etc., shall all be determined to be located, installed, and functioning in accordance with applicable regulations and approved plans. The engineer's alarm panel, particularly the steering gear alarms, shall be tested for proper operation. All electrical equipment, including motors, controllers, panels, lighting fixures, etc., shall be given general approval, specifically approved for the vessel, or listed by the Coast Guard as satisfactory equipment for installation on inspected vessels. Portable items of electric equipment, such as portable cargo lights, tools, fans, etc., shall be similarly examined. Even in new devices, the cord provided shall be checked to ensure that it provides a grounding conductor. This is necessary since the device may be sold to a distributor without the portable cord. The distributor may not properly wire the device or may not use a proper cord (see 46 CFR 111.05).

30-6-55D. SUBSEQUENT ELECTRICAL INSPECTIONS

30-6-55D(1). General. In carrying out the tests and inspections described in 46 CFR 111.05-10(d), the inspector shall pay particular attention to the items listed in this section of the manual. The inspector shall determine mechanical and electrical conditions, performance, safety of personnel against shock hazards, and safety of the vessel against fire hazards.

30-6-55D(2). New and Modified Circuits. Circuits and equipment which have been added or modified since the last inspection shall be given special attention to determine that they comply with the regulations.

30-6-55D(3). Navigation Lights. Navigation lights shall be examined for corrosion of materials and for satisfactory condition of portable cable and receptacles. Navigation light panels shall be tested for satisfactory operation and proper functioning of alarms.

30-6-55D(4). Lifeboat Winch Electrical Equipment. All enclosures for electrical lifeboat winch control equipment such as limit switches, master switches, emergency disconnect switches, etc., shall be opened and examined for evidence of water or corrosion. In particular, attention shall be given to the proper functioning of limit switches and emergency disconnect switches in control circuits of lifeboat winches. Casualty investigations have indicated the need to specifically examine the clutch interlock switches on dual winches, such as those on Victory-type ships. It is essential for safety of life at sea that satisfactory limit switches and emergency disconnect switches be used with gravity davits and power-operated winches. Therefore, a test operation of the lifeboat winch controls, including limit switches, emergency disconnects, clutch interlocks where employed, etc. shall be conducted at each inspection for certification and at such other times as the inspector may require to maintain this equipment in satisfactory condition.

30-6-55D(5). Watertight Doors. The inspector shall thoroughly check the watertight door systems at the inspection for certification to verify that such systems are in satisfactory operating condition. The enclosures for all local-control door switches and controllers should be opened and examined for evidence of water or corrosion. It has been found that faulty operation of electrically operated watertight doors may be caused by seawater entering the local control switch (master switch) located at the watertight door. If seawater has entered the switch enclosure, it may short circuit the motor starter and motor with the result that the door may open even with the wheelhouse control in the "closed" position. The inspector, if possible, shall also be satisfied that the ship's personnel are familiar with the watertight door system, location of disconnect switches, etc.

30-6-55D(6). Electrical Cables. The condition of cables should be determined by insulation resistance readings and by visual observations (see paragraph 30-6-55C(3)). Deterioration of the armor of a cable, which is otherwise in good condition, should not be considered as sufficient cause for requiring replacement unless this armor is the primary means of grounding the connected equipment.

30-6-55D(7). Ground Detection Systems. Ground detection systems should be functioning properly. Where lamps are used, they should be of the proper wattage, and the connections between the lamps grounded. Ground faults should be cleared.

30-6-55D(8). Temporary Wiring and Installations. Jury rigs, temporary modifications, long extension cords, etc., are not satisfactory installations. Such temporary installations should either be made permanent or removed.

30-6-55D(9). Portable Electric Equipment. New or replacement items shall meet the requirements outlined in subpart 31-3-5 of this manual. Existing equipment shall be checked to see that it is serviceable and free from potential shock or fire hazards. Metal bodies of these items shall be grounded through grounding leads in the portable cord. To be effective, the grounded conductor must be connected to a grounding terminal on the case of a tool or light. This conductor must be electrically continuous (that is, the wire should not be broken anywhere along its length). This can be checked with an ohmmeter or megger. For portable devices made entirely of nonconducting material or so constructed that dead-metal parts will not become energized under any condition, the grounding conductor in the portable cord and the grounding pole of the attachment plug need not be furnished. No splices or patching should be permitted in the portable leads. Careful checks shall be made of the condition of the cord where it enters the light or tool. This is a location of severe stress and bending fatigue, especially on items such as portable cargo lights. Cracking, brittleness, or heat discoloration of the cord at this point should be sufficient reason for rejection. If the device is to be rewired, only cords permitted by 46 CFR Table 111.60-5(b) for hard or extra hard service should be used. Lighting fixtures should be examined to see that the interior insulation is satisfactory, particularly the lamp holder. Cracked porcelain or plastic lamp holders should be replaced. Devices in which the exterior case is cracked or damaged should be replaced or repaired.

30-6-55D(10). Fire and Smoke Detection Systems. Fire and smoke detection systems shall be checked regularly, and faulty detectors shall be recalibrated or replaced. The following test methods may be used for the various detectors indicated:

(a) Thermal detectors may be tested by replacing the guard and globe with a sheet-metal shield and using a portable light as the heat source which will not cause damage to the adjacent paintwork. The activation temperature range should be as specified in 46 CFR 161.002-11;

(b) Photoelectric and ionization smoke detectors may be tested by the use of pink sticks or other smoke source held near the detector;

(c) Infrared detectors may be tested using a candle or other flame source. These detectors often have a response delay that must be accounted for.

30-6-55D(11). Vital Machinery. Motors, motor starters, and control switches used with machinery vital to the safety or propulsion of the vessel shall be visually examined for condition and suitable nameplate ratings. When there is evidence of deterioration, they should be opened for closer inspection.

30-6-55D(12). Electric Cooking Equipment. Electric cooking equipment shall be examined to ensure that it is maintained in good condition. There should be no evidence of grease or dirt buildup nor deterioration of the equipment.

30-6-60. LEAKAGE ONTO PROPULSION SYSTEM CONTROL CIRCUITS, SWITCHBOARDS, ETC.

The casualty to the SS TRANSHURON was the result of water being sprayed on the main propulsion control area from an air conditioning cooling water gauge nipple that failed. This casualty points out the need to keep all water lines clear of control circuits, electrical equipment, areas of high voltage, etc., when possible.

In a similar casualty involving water and electricity, water leaked onto the main switchboard from an exterior electrical junction box that became full of water. The conduit and wire provided the path to the switchboard.

From these casualties it is obvious that shielding or other measures to guard against accidental discharge of water onto electrical equipment should be used. Cables to switchboards, controllers, etc., should be connected so as to prevent water from entering connectors (use of drip loops, entering from the bottom side, etc.).

30-6-65. EMERGENCY LIGHTING AND POWER SYSTEMS

30-6-65A. GENERAL

Reports of recent casualties indicate that, in some instances, the emergency diesel generator set and its associated equipment were not maintained in all respects in a satisfactory state of readiness for emergency use. 46 CFR 35.10-15, 78.17-45, and 97.15-30 require periodic testing by vessel personnel of the emergency lighting and power systems, when installed, and the recording of such tests in the official log books. Various sections of this manual and the regulations for tank vessels, passenger vessels, cargo and miscellaneous vessels, and electrical engineering intend that the emergency lighting and power plant, if installed, be tested in the presence of an inspector. The testing of a properly functioning emergency plant can quickly be accomplished and should cause little or no interference with normal service. By using 46 CFR Table 112.055(a), one can note the vessels which are required to have an emergency source of power meeting the requirements of 46 CFR 112.

30-6-65B. TESTING

At each inspection, and whenever emergency drills are conducted for any vessel having an emergency source of power installed, the emergency system shall be tested as follows:

(1) On those vessels having an automatic starting and/or transfer system, either battery or generator powered, a test should be made by having the circuit breaker on the main switchboard that controls the normal supply to the emergency switchboard placed in the open position. This breaker should easily be distinguished by the nameplate required for all such devices. Upon interruption at the main switchboard of the normal supply to the emergency switch-

board, the diesel engine should start and the emergency generator or battery should assume the load on the emergency switchboard as outlined in 46 CFR 112.20, 46 CFR 112.25, and 46 CFR 112.30; or

(2) On those vessels having a manual system, the test may be performed by having the normal supply to the emergency switchboard opened and the manual starting device operated. Upon operation of the manual starting device, the load should be transferred as outlined in 46 CFR 112.35. Again, satisfactory operation may be determined by observing that the emergency lighting is transferred and by noting the indications given by the meters, gauges, etc., on the emergency switchboard and emergency diesel engine. It should be noted that 46 CFR 112.35-1(a) requires that the transfer be done by only a single manual operation. This does not permit a manual operation for starting the emergency set plus another manual operation for transferring the electrical load. Manual starting with automatic transfer or automatic starting with manual transfer is intended for manual systems. The manual system was originally designed to permit the transfer of the emergency load to an emergency storage battery for vessels in that category.

Some passenger vessels contracted for prior to November 19, 1952, and meeting the requirements of 46 CFR 112.90, may not be arranged for testing as outlined above. Tests on any vessel in this category should be performed in a manner compatible with the arrangement thereon. Many older vessels have an inport or standby generator and no emergency plant as such. These are usually arranged to feed directly to the main switchboard and cannot be tested in the manner outlined above. The testing of such standby units is left to the discretion of the OCMI.

30-6-70. INSPECTION OF RADIO EQUIPMENT

30-6-70A. GENERAL

30-6-70A(1). Cooperation with FCC. When the OCMI is notified by the local representatives of the Federal Communications Commission (FCC) that deficiencies concerning the technical aspects of the radio installation exist on a vessel, the Safety Certificate should be withheld until the deficiencies are corrected and formal notice to that effect is received. In cases where such deficiencies exist on a vessel already in possession of an active Safety Certificate, to an extent that the FCC recommends withdrawal of this certificate, such action should be taken by the OCMI. Marine inspectors should consult with the local representatives of the FCC before reaching a decision as to the proper action to be taken under the circumstances, and shall cooperate fully with FCC inspectors to carry out the intent of these instructions. The Certificate of Inspection should neither be withheld nor withdrawn in connection with technical radio deficiencies (see part 30-9 of this manual regarding instructions on Safety Radiotelegraphy and Safety Radiotelephony Certificates, and subpart 31-3-40 regarding portable lifeboat radio equipment).

30-6-70A(2). Technical Determinations by FCC Inspectors. It should be kept in mind that the technical aspects of the radio installation itself, its adequacy, and efficiency are to be determined solely by FCC inspectors. The question of the suitability of the electrical wiring installed in the radio room which interconnects the various components of the radio installation or the radio direction-finding equipment is within the jurisdiction of the FCC and is to be determined by FCC inspectors who are solely responsible for the proper maintenance and efficient operation of the equipment.

30-6-70A(3). Power and Wiring for Radios. The adequacy and suitability of the power leads from the main power supply to the main radio installation in the radio room are under the sole jurisdiction of the Coast Guard. The amount and character of the power supply, however, must be adequate, as determined by the FCC, to operate the radio installation and its auxiliary equipment properly and efficiently. When any inadequacies in the power supply are observed by the FCC, the Coast Guard will be notified and take action to ensure that the deficiencies are corrected. All other electrical wiring in the radio room not connected with the radio installation is under the jurisdiction of the Coast Guard.

30-6-70B. EMERGENCY RADIO GEAR

The installation of the ship's radiotelegraphy station must be placed in a location approved by the Coast Guard. In this regard, the inspector shall be satisfied that the main and emergency radio installations are located in the upper part of the ship in a position of the greatest possible safety, as high as practicable above the deepest load water line. The emergency installation shall be provided with a source of power independent of the propelling power of the ship and of the main electrical system, capable of being put into operation rapidly, and capable of operating for at least six continuous hours. It should also be noted that the use of the emergency battery as a source of power for other than radio equipment and emergency lights in the radio room is prohibited.

30-6-75. HAZARDS AND UNSAFE PRACTICES

30-6-75A. GENERAL

The following instructions are intended to promote the detection, reporting, and correction of those practices and situations on vessels which tend to cause accidents and result in injury to personnel and damage to property. The items of safety are separate from, but directly related to, the items of equipment, construction, etc., to which inspection attention is directed by the regulations and for which separate reports are required.

It is obvious that an inspected vessel with defective cargo gear, dangerous gangways or access ladders, unguarded openings in the holds, poorly lighted working spaces, or other hazards, cannot meet the requirements of law that the vessel be in a condition to warrant the belief that it is suitable for the service in which it is employed. Traditionally, it is the duty of the vessel's master and licensed officers to see that dangerous conditions are corrected immediately. However, the inspector shall keep general safety requirements in mind and be alert to hazards which are noted. These general safety requirements (or "good marine practice") may not always be spelled out in the laws or regulations because to do so would be impractical. However, the practices of good seamanship and good shipkeeping will necessarily vary according to the size, design, and operating conditions of the vessel.

30-6-75B. STATUTORY REQUIREMENTS

It is of paramount importance that general safety of life aboard vessels be kept in mind at all times. When hazardous conditions are noticed, immediate steps shall be taken to remove such hazards so that working conditions can be made as safe as reasonably permitted. The attention of the inspector and vessel officers is directed to Congressional enactments for the "better protection of life," and "to promote safety at sea." The marine safety statutes were enacted for the purpose of safety of life and property on board vessels and these laws apply at all times when the vessel is in commission, whether alongside the dock, lying in the stream, or under operation. The basic responsibility of the Coast Guard for safety is imposed by 46 U.S.C. 367, 390, 391, 391a, 392, and 404 which, by reference in other statutes, are also applicable to vessels other than steam vessels. These statutes, as well as 46 U.S.C. 435, authorize the Coast Guard to inspect and reinspect ships for safety purposes.

30-6-75C. RESPONSIBILITY OF SHIP'S OFFICERS

The master and ship's officers are responsible for maintaining safe working conditions and the supervision or the establishment of proper supervision covering all employment on board a vessel. All hazardous work should be personally supervised by a competent ship's officer. Inattention to duty or negligence on the part of any ship's officer in permitting unsafe conditions or practices, should be admonished and, if sufficiently severe, should be charged against the license of the officer with the primary objective of improving safety and the indoctrination of ship's officers in their responsibilities. However, all persons employed on board have a mutual responsibility to carry out the established procedures for the safety of themselves and their coworkers.

30-6-75D. RESPONSIBILITY OF INSPECTORS

It is the duty of the marine inspector, when on board an inspected or uninspected vessel for any purpose, to be alert to unsafe practices and hazardous situations. To carry out this basic duty of promoting safety of life on vessels, the inspector must take proper and immediate steps to see that unsafe practices are stopped and hazardous situations remedied.

The steps necessary to maintain safety will, of course, vary with the situation encountered. In many cases, calling the attention of the ship's officers or master to the situation will be sufficient. In certain instances it may be necessary to issue a Form CG-835 to cover a deficiency. Serious cases or cases in which there is disagreement over corrective action to be taken should be brought to the attention of the OCMI immediately to obtain a resolution of the matter. Revocation of the vessel's Certificate of Inspection, action against an officer's license under 46 U.S.C. 239 (as amended), or submission of a Report of Violation may be necessary.

30-6-75E. RESPONSIBILITY OF THE OCMI

OCMI's shall give their personal attention to the detection of unsafe practices and hazardous situations to the end that the greatest possible safety is obtained on the vessels operating under their jurisdiction.

30-6-75F. HAZARDOUS SITUATIONS

30-6-75F(1). General. All exposed and dangerous places must be properly protected with covers, guards, or rails. See 46 CFR 32.01-10, 32.01-15, 58.01-20, 72.40, 92.25, and 190.25-15. These regulations also specify the height and number of courses or rails on passenger and crew decks. Two avenues of escape should be provided from every general area within a vessel where passengers or crew may be quartered, or where anyone may normally be employed (see 46 CFR 32.01-1, 72.10, 92.10, and 190.10). While it is not always possible to provide such exits from the holds, the means of escape provided should be adequately safe and easily accessible.

30-6-75F(2). Emergency Equipment. Many vessels are required to carry gas masks, self-contained breathing apparatus, or fresh air breathing apparatus in varying amounts (see 46 CFR 35.30-20, 77.30, 96.30, and 195.30). Coast Guard records indicate that this equipment has often helped in cases of emergency. In one case, where carbon dioxide was present in the hold of a vessel in lethal quantities, a stevedore was rescued by means of the use of self-contained breathing apparatus by one of the officers of the ship.

30-6-75F(3). Hot Work. When "hot work", such as riveting, welding, drilling, burning, or any spark-producing operation in or on the boundaries of oil tanks, etc., is to be done, the regulations require that a gas-free certificate stating that the repairs involved may be made safely must be obtained before starting such "hot work" (see 46 CFR 35.011, 71.60, 91.50, and 189.50). Since most "hot work" is done while a vessel is tied up to a dock or in a shipyard, the effect of this requirement is to safeguard the lives of the shore workers doing such repairs and the seamen that may be required to be aboard, as well as guarding the vessel and shore property from damage. While this requirement has not entirely eliminated the occurrence of casualties as a result of "hot work", it has reduced the number of such casualties to the point where they have not occurred unless working personnel were lax in performing such "hot work" after a considerable period of time had elapsed since the compartment was gas-freed.

30-6-75F(4). Refrigerants. The dangers inherent in the use and transportation of dry ice or carbon dioxide as a refrigerant have often been overlooked. As a result of a series of casualties involving deaths of stevedores and seamen, when carbon dioxide or dry ice was used as a refrigerant, direct action was taken to call the attention of shipowners, operators, and others of the inherent dangers of dry ice. Container cargo may be refrigerated by introduction of liquid nitrogen into the container where it then evaporates, chilling the contents. Unless sufficient time elapses to ensure complete evaporation before the container is loaded aboard ship, there is a risk of spillage of liquid nitrogen. Since the temperature of liquid nitrogen (-3201°F) cannot be withstood by ordinary ship steel, its spillage can result in fractures.

30-6-75F(5). Steam. It is obvious that a boiler or steam pipe accident, if it occurs alongside the dock, may be just as hazardous to shore workers as to personnel on board the vessel.

30-6-75F(6). Transporting Personnel. In the case of a vessel lying in the stream, when stevedores or shore workers are transported to the vessel on towboats, barges, or water taxis, their safety during such transportation is required by several statutes. For instance, 46 U.S.C. 458 provides that the Coast Guard may authorize towboats to carry on board such number of persons, in addition to its crew, as shall be deemed necessary to carry on the legitimate business of such towboats, not to exceed one person to every net ton of measurement of such towboat. The vessel must have on board, in accessible places, one life preserver for every person allowed to be carried (see 46 U.S.C. 459). If water taxis or passenger-carrying craft are used for the purpose of transporting stevedores or shore workers, such vessels are inspected by the Coast Guard if they carry more than six passengers. If water taxis or passenger-carrying craft used for the transportation of stevedores or shore workers carry six or less passengers, they are required by the Motorboat Act of 1940, as amended (46 U.S.C. 526 *et seq*) to carry certain equipment such as life preservers and fire extinguishers and to be operated by a licensed motorboat operator.

30-6-75G. PREVENTING BOILER GAS EXPLOSIONS (FLAREBACKS)

An explosion in the furnace of a water-tube boiler may be caused by the ignition of gas accumulations from vaporized oil which has been allowed to enter the furnace improperly. Vapors which have not been purged from the furnace before "lighting off" burners may also be a cause of explosion. The following rules to reduce the hazards of these backfires should be brought to the attention of all engineroom personnel:

(1) Before attempting to "light off" the first or additional burners, ensure that properly heated oil is available at the burner to be lighted. The recirculation line is provided for this purpose;

(2) Before installing an atomizer, ensure that it is fitted with a sprayer plate, and that the burner tip is tightly made up;

(3) Before lighting the first burner or again "lighting off" a burner after all burners have been extinguished, the forced draft fan should be run long enough, with double front damper and burner registers wide open, to ensure that the furnace is properly purged;

(4) When "lighting off" the first burner or additional burner, always use a torch. Never attempt to light a burner from an adjacent burner or from hot furnace brickwork;

(5) When lighting a burner, with the torch lit and in proper position, the last valve in the branch connection leading from the fuel-oil header supply line to the burner should be slightly opened. As soon as ignition occurs, this valve should be fully opened. If ignition does not immediately occur, the

burner valve should be closed and the furnace thoroughly purged. This entire operation shall be repeated until ignition does occur;

(6) While a burner or burners are in service, the register door on such burner or burners should be wide open, and the oil temperature and pressure should be kept under close observation. Cold oil or low oil pressure may cause the burners to extinguish. Water in the fuel oil may produce the same conditions. Should all the burners be extinguished, the valves in the individual branch connection to each of the burners should be closed, the forced draft fan should be kept in service, double front damper and all burner register doors should be opened wide, and the furnace should be thoroughly purged before an attempt is again made to light the burner.

30-6-75H. GALLEY EXHAUST DUCTS

A number of shipboard fires have originated in the exhaust ducts of galley ranges and fryers. In some cases, these fires have resulted in serious damage to the vessel, injury, and loss of life. Eventually, exhaust duct work will become saturated with cooking grease and pose a potential fire hazard. Such areas tend to be overlooked during vessel inspections.

The following examination procedures shall be followed during biennial and mid-period inspections of U.S. vessels and during SOLAS verification examinations of foreign-flag vessels:

30-6-75H(1). Passenger and Freight Vessels.

(a) Remove the inspection plate from the galley exhaust duct;

(b) Disconnect the fusible link, if installed, and test the operation of the fire damper;

(c) Remove sufficient inspection plates to ensure that the duct work is clean and free of grease. Particular attention shall be given to long, horizontal duct runs;

(d) Examine all hood screens for cleanliness;

(e) If an extinguishing system is installed, ensure that it is in proper working condition.

30-6-75H(2). Passenger Vessels Only.

(a) Remove sufficient overhead panels to ensure that the galley exhaust duct is suitably insulated in accordance with SOLAS standards and applicable U.S. regulations. Unless changes are made to the duct work, this part of the examination need be made only once;

(b) Check all main and zone control valves of the sprinkler system to ensure that they are in the full open position.

30-6-75I. DIESEL-FIRED BOILER EXPLOSIONS

A number of boiler explosions have occurred aboard vessels equipped with auxiliary boilers which burn diesel oil. An explosion can occur whenever the fuel and air mixture in the furnace at any given instant is not properly controlled; even very small accumulations of fuel oil in the boiler can produce explosive mixtures. An automatic control system that is properly designed, operated, and maintained can safely burn diesel oil.

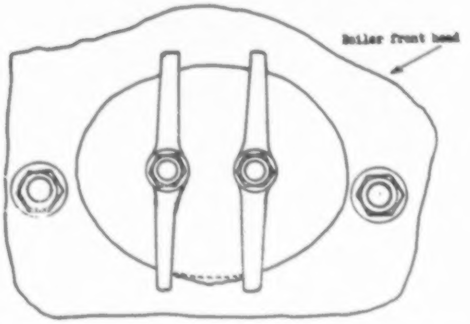
At each inspection or reinspection for certification of vessels equipped with diesel-fired boilers, the inspector shall ensure that the following operational conditions are met:

(1) Fuel oil shutoff valves shall be inspected or tested to ensure that there is no leakage;

(2) No time should elapse between a furnace purge and a lightoff or ignition trial, to prevent a vapor build-up from residual fuel in the furnace;

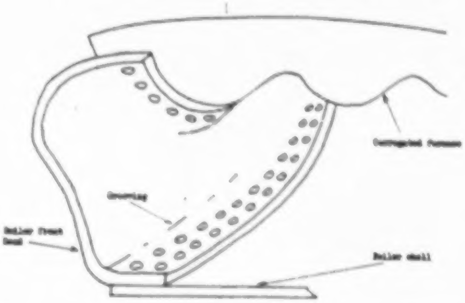
(3) Controls to shut down the boiler due to flame failure are satisfactorily tested to ensure safe boiler operation.

PLATE 30-6-35C(2).1
DEFECTS AND REPAIRS TO FIRETUBE BOILERS



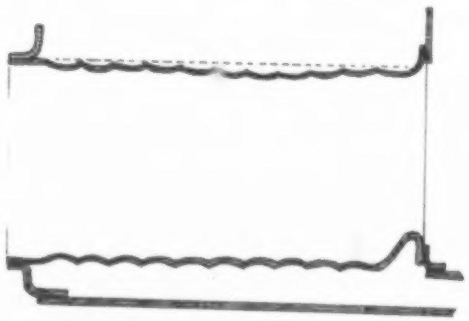
WASTAGE OF SCOTCH BOILER FRONT HEAD BELOW MANHOLE OPENING

Figure 1.--Repair consists of thorough cleaning or grinding to sound metal, magnetic particle testing to ensure that no fractures exist and building up to original thickness by welding.



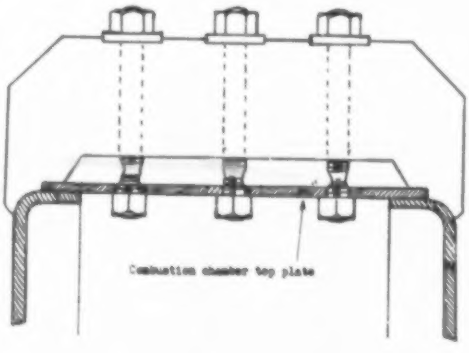
GROOVING OF FRONT HEAD BELOW FURNACE

Figure 2.--Grooving in this area, when it is not extensive, may be repaired by chipping out the groove to sound metal, non-destructive testing, and subsequent welding. Extensive grooving, or fractures stemming from old grooving previously welded can be repaired only by cutting out and renewing a portion of the head plating.



DISTORTED CORRUGATED FURNACE

Figure 3.--Repair in conformity with procedure outlined in 46 CFR 59.15-1.



COMBUSTION CHAMBER GIRDER STAYS WASTED BY CORROSION

Figure 4.--Repaired by renewal of deteriorated staybolts.

PLATE 30-6-35C(2).2
DEFECTS AND REPAIRS TO FIRETUBE BOILERS

DETERIORATED COMBUSTION CHAMBER BACK PLATES, DUE TO STAY LEAKAGE

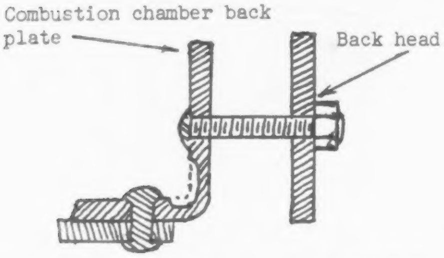


Figure 5.--Repairs. Moderate wastage in relatively small areas may be built up by welding, within the limitations specified in 46 CFR 59.10-10. Larger deteriorated areas should be repaired by cutting out the defective plate along the line of staybolts and welding in new plate. All rivets and staybolts in the area should then be renewed.

CRACKS IN TUBE HOLE LIGAMENTS

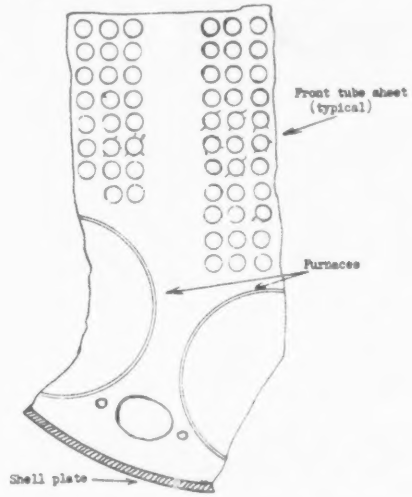


Figure 6.--Repairs. Relatively minor fractures, few in number, may be repaired by excavating to sound metal, magnetic particle testing, and welding. Cracks covering a large area should be repaired by cutting out the defective portion of the tube sheet and welding in a new piece of plate.

TYPICAL WASTAGE OF SCREWED STAYS AT COMBUSTION CHAMBER BACK PLATE

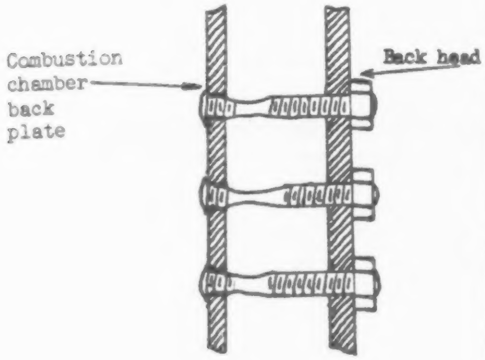


Figure 7.--Repairs. Remove defective stays, determine if plating has also deteriorated; if found satisfactory, renew stays.

DETERIORATED COMBUSTION CHAMBER BOTTOM AND FRONT PLATE DUE TO LEAKAGE FROM RIVETED SEAM

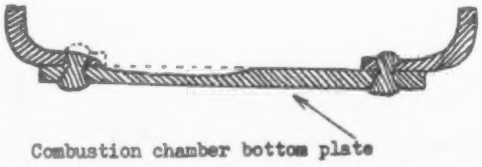


Figure 8.--Repairs. The deterioration of the combustion chamber bottom plate illustrated here has progressed to an advance stage; repairs consist of cutting out the wasted portion and replacing it with a new plate. The wasted edges of the front plate should be built up by welding, the rivet holes reamed, and new rivets driven.

PLATE 30-6-35C(2).3
DEFECTS AND REPAIRS TO FIRETUBE BOILERS

COMBUSTION CHAMBER BACK PLATE
BULGED BETWEEN STAYBOLTS

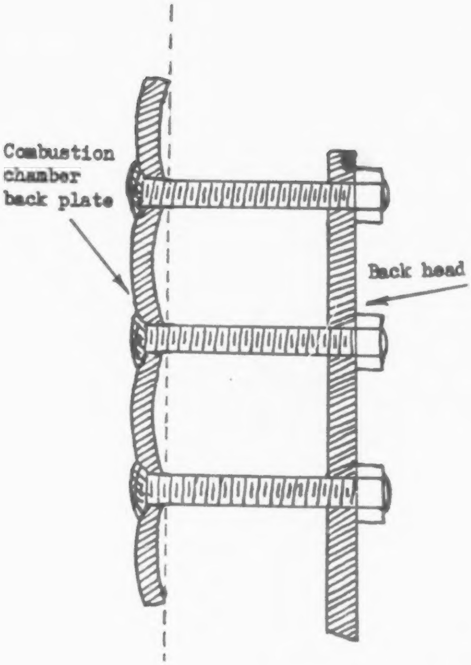


Figure 9.--Repairs. This condition is usually associated with thinning of the back plate as a result of corrosion, or heavy scale on the water side of the plate. The Marine Engineering regulations (46 CFR 59.15-5) provides that repairs may be made by inserting an additional staybolt in the center of the spaces supported by the four staybolts. Where deterioration of the plating has occurred, the defective section must be cut out, and a new portion welded in. All staybolts in the area must then be renewed.

RADICAL GROOVING IN BOILER BACK HEAD
ORIGINATING IN STAY ROD HOLES

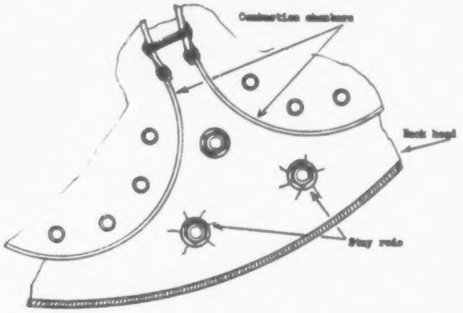


Figure 10.--Repairs. The stay rods should first be removed; the area is then thoroughly cleaned and the grooves excavated to sound metal. The excavated area should then be examined by magnetic particle testing to ensure that no cracks are present. Cracks shall be chipped out, working if necessary from both sides of the plate; after the preparation of satisfactory welding grooves, the area should be welded, following the procedure outlined in 46 CFR 59.10-5(h).

PLATE 30-6-55C(3).1

1. GENERAL INSULATION RESISTANCE FORMULA FOR VITAL MOTORS AND GENERATORS

$$R(\text{In megohms}) = \frac{E}{\frac{KVA}{100} + 1,000}$$

Where: E = Rated line to line voltage of the machine.
KVA = Rated kilovolt amperes.

2. GENERAL RESISTANCE TABLE FOR CABLE[1]

CIRCUIT		Minimum insulation resistance
0-5	amperes, inclusive	2.0 megohms
6-10	amperes, inclusive	1.0 megohms
11-25	amperes, inclusive	400,000 ohms
26-50	amperes, inclusive	250,000 ohms
51-100	amperes, inclusive	100,000 Ohms
101-200	amperes, inclusive	50,000 ohms
201-400	amperes, inclusive	25,000 ohms
401-800	amperes, inclusive	12,000 ohms
Over 800	amperes	5,000 ohms

[1] The values for a circuit should be determined with the circuit de-energized, with all switches or circuit breakers connected in the circuit closed, and with all panelboards, controllers, fuses, and fuseholders in place.

MARINE SAFETY MANUAL (CG-495)

PART 30–7—VESSEL REINSPECTIONS

30–7–1. GENERAL

The examinations of vessels carried out between the periodic inspections for certification will, of necessity, be lacking in uniformity. The reinspections contemplated by the vessel inspection laws are intended to be directed more toward the equipment and safe operating condition of the vessel than toward reestablishing basic conditions of hull and machinery. It is intended that reinspections vary in scope according to the conditions found, the vessel's previous record of maintenance, and the time available to the inspector. The inspections should not become so routine or perfunctory that the vessel operator can predict the scope, but rather should have considerable variation to the end that all parts of the vessel and its equipment will be maintained in a safe condition.

Special attention shall always be given to lifesaving equipment, firefighting equipment, and watertight closures at the time of reinspection, but the inspector should also vary the degree of inspection of these items according to the circumstances. Those accessible parts of the hull and machinery that are normally subject to neglect and rapid deterioration shall, of course, be included within the scope of the reinspection. Of necessity, great latitude is afforded the inspecting officer in establishing the overall scope of any reinspection. The inspector may broaden or restrict the scope based on his evaluation of the overall condition of the vessel; however, the intent of the regulations in 46 CFR 31.10–17, 71.30, and 91.27 shall be complied with.

Upon completion of a reinspection, the inspector shall be reasonably satisfied as to the condition of the items he has examined and the general overall condition of the vessel. The inspector shall be satisfied that the degree of compliance with the law, regulations, and terms of the certificate warrants the continued possession of the certificate. The inspector is not limited in the scope of his examinations at a reinspection, and, if conditions warrant, he may carry out an inspection similar in scope to that of an inspection for certification.

In evaluating a vessel's degree of compliance, minor defects or imperfections which do not within themselves hazard the vessel shall not be construed as rendering the vessel unsafe for continued operation. The correction of all deficiencies shall be carried out in a manner similar to the procedures used in correcting deficiencies discovered during an inspection for certification. In other words, vessels may be granted reasonable periods of time in which to correct deficiencies. The Coast Guard has administratively determined that in the absence of special circumstances, the reinspections of vessels shall be on the basis of three per year on passenger vessels, one per year between inspections for certification for small passenger vessels, and once during the life of the biennial certificate in the case of cargo, tank, and miscellaneous vessels. This policy is not intended to restrict any OCMI from conducting a reinspection on any vessel at any time if such vessel is suspect, or if the OCMI has reason to believe that the vessel's degree of compliance is such that it no longer warrants the continued possession of her Certificate of Inspection. However, OCMI's shall not conduct indiscriminate, unnecessary reinspections of vessels.

30–7–5. REFERENCES

30–7–5A. LAWS

30–7–5A(1). 46 U.S.C. 435. This law authorizes and requires the reinspection of all certificated vessels and states in part as follows:

> In addition to the annual or biennial inspection...shall require the Coast Guard to examine, at proper times, inspected vessels arriving and departing to and from their respective ports, so often as to enable them to detect any neglect to comply with the requirement of the law, and also any defects or imperfections becoming apparent after the inspection aforesaid, and tending to render the navigation of the vessel unsafe...."

30–7–5A(2). 46 U.S.C. 390 **et seq.** Under this law, regulations have been promulgated which require annual reinspections of small passenger vessels.

30-7-5B. REGULATIONS

The following regulations require the reinspection of certificated vessels at stated intervals and establish the scope of such reinspections:

- Cargo & Miscellaneous Vessels – 46 CFR 91.27
- Passenger Vessels – 46 CFR 71.30
- Tank Vessels – 46 CFR 31.10–17
- Small Passenger Vessels – 46 CFR 176.10
- Oceanographic Vessels – 46 CFR 189.27

A provision in the regulations (46 CFR 2.01–10(b)) provides notice to the public that the Coast Guard, on its own initiative, may examine, inspect, or reinspect vessels subject to certification at any time.

▼30–7–10. REINSPECTION OF PASSENGER VESSELS

▼30–7–10A. PASSENGER VESSELS WITH ONE-YEAR CERTIFICATES

Reinspections of each passenger vessel holding a one-year Certificate of Inspection are to be carried out three times annually and as nearly as possible at equal intervals. Vessels which operate on a seasonal basis shall be reinspected not less than three times during the period of operation *and* prior to placing the vessel back in service. The purpose of the reinspection is as stated in subpart 30–7–1 above. An examination of all accessible parts of the hull and machinery which are most susceptible to neglect or damage, together with an inspection of the safety and operating equipment of the scope indicated by the general appearance and overall maintenance of the vessel, shall be carried out to the satisfaction of the inspecting officer. The discovery of any condition that in itself does not necessarily hazard the vessel but which can be construed to be an indication of the general condition of the vessel should alert the inspecting officer that the scope of the reinspection should be broadened. Emergency drills shall also be conducted to the satisfaction of the inspecting officer. See 46 CFR 71.30.

30–7–10B. PASSENGER VESSELS WITH THREE-YEAR CERTIFICATES

The scope of the reinspections of small passenger vessels inspected under 46 CFR Subchapter T is described in 46 CFR 176.10–5. Steam vessels require special consideration with regard to the inspection of boilers. In general, reinspections of all these vessels shall be made at approximately equal intervals between triennial inspections. OCMI's shall cooperate with owners and operators of vessels insofar as practicable in scheduling reinspections so that the inspections will interfere as little as possible with the normal business of the vessel.

In view of the wide latitude granted to OCMI's in the initial inspection of existing small passenger vessels, the reinspection of a vessel holding a certificate that is issued in another marine inspection zone should be preceded by a study of the vessel's file and inspection records obtained from the certificating OCMI. Questions concerning the vessel's structure or equipment shall be resolved between the OCMI's concerned prior to issuing major requirements against the vessel.

30–7–15. REINSPECTION OF TANK, CARGO, AND MISCELLANEOUS VESSELS

30–7–15A. REQUIRED REINSPECTIONS

Each tank, cargo, and miscellaneous vessel that has been certificated for a 2-year period shall be reinspected at least once during the life of its certificate. This reinspection shall, if possible, be carried out between the 10th and 14th month following the date of the issuance of the certificate. The four-month period occurring between the 10th and 14th month following the date of certification is hereby defined as a "mid-period" and shall be so termed.

In addition to the reinspection carried out during the mid-period, a reinspection shall always be carried out simultaneously with a drydock examination except as provided in 30–7–20B. If the reinspection which is carried out with a drydock examination occurs during the mid-period, such reinspections shall be deemed as meeting the requirements that the vessel be reinspected once during the life of her certificate.

The establishment of the mid-period as the time in which to conduct reinspections is for guide purposes, and deviations of short periods of time from this mid-period should not be construed as rendering a vessel immediately liable for reinspection.

30–7–15B. SCOPE OF REINSPECTIONS

The mid-period reinspection of tank, cargo, and miscellaneous vessels is normally much less detailed than a biennial inspection for certification. It shall be sufficiently extensive to promote the belief on the part of the inspecting officer that the vessel's degree of compliance with the law, regulations, and terms of its certificate warrant the vessel's continued possession of its certificate and, further, that it can continue to be navigated with safety. This reinspection is essentially an equipment and operational inspection and the conduct of the reinspection shall be so directed. However, all accessible parts of the hull and machinery (especially those which are normally subject to neglect and rapid deterioration) shall be included within the scope of the reinspection. Great latitude is afforded the inspecting officer by the regulations in establishing the overall scope of any reinspection. The inspector may broaden or restrict the scope based on his evaluation of the overall condition of the vessel but the intent of the regulations shall be complied with. Lifesaving and firefighting equipment and watertight closures shall be given special attention. Equipment and devices for vessel control shall be tested and emergency drills held, if practicable. In evaluating the vessel's compliance, minor defects or imperfections that do not within themselves hazard the vessel shall not be construed as rendering the vessel unsafe for continued operation.

If the drydock examination and simultaneous reinspection occur other than during the mid-period, it shall constitute an additional reinspection and the scope thereof shall be governed by the time when such drydocking occurs with reference to the date of the issuance of the certificate. For instance, a reinspection carried out during a drydock examination, which takes place shortly after the date of certification, could normally be limited. One occurring a short time prior to the expiration of the certificate should be conducted with the thought in mind that duplication of inspection effort is not intended, but that the vessel must continue to be capable of being navigated with safety. The scope of the reinspection, held other than during the mid-period or in conjunction with the drydocking, shall be as directed by the OCMI.

30–7–20. REINSPECTION CONTROL OF VESSELS

30–7–20A. CONTROL BY THE OCMI

The OCMI shall exercise reinspection control over all vessels that he certificates, insofar as possible. This shall not be construed as requiring that the reinspection be conducted only by inspectors of that office or in that marine inspection zone. In addition to ensuring the reinspection of vessels which he has certificated, the OCMI shall inquire into all vessels operating within his zone to the end that all required reinspections are held. OCMI's who conduct reinspections of vessels which they did not certificate, shall notify the OCMI who issued the Certificate of Inspection by forwarding a copy of Form CG-3821 (MVI Inspection Record) to him.

For those vessels not available for reinspection within the zone of inspection for certification, if no notice has been received by the end of a mid-period for tank, cargo, or miscellaneous vessels, or within a reasonable length of time after reinspection is due on passenger vessels, the OCMI who issued the Certificate of Inspection shall determine the vessel's status and location. When the OCMI exercising control has knowledge that a vessel will be available in another zone at the time it is due for reinspection, he shall notify the OCMI of the other zone.

30-7-20B. RESPONSIBILITY OF OWNERS AND CREW

The problems that may be encountered when trying to locate certain vessels for reinspection must be handled, for the most part, by the responsible OCMI. There is no authority in either law or regulations by which owners or operators can be required to make arrangements for these reinspections. OCMI's shall cooperate with masters and owners in scheduling reinspections so that the inspection program will not interfere with the normal movement of the vessels. Requests for deferments of reinspections, which have merit, should be favorably considered. Such deferment requests should be granted when the reinspection required can be accomplished at a later time, such as during the vessel's return to the same or another port, *provided* the basic requirements of the reinspection program are met.

On all inspected vessels (especially tank, cargo, and miscellaneous vessels, and oceanographic vessels inspected on a biennial basis), the owners, their representatives, and masters shall be advised of those items that are required by the regulations to be inspected, replaced, or serviced at a given interval. Thus, regardless of the time that an inspection for certification or reinspection is held, it is the responsibility of the owner to see that required inspections and tests (such as hydrostatic tests of boilers and inspection of boiler mountings) are held when due. When these required inspections or tests are not carried out, the owner becomes subject to the penalty of law in addition to the possible revocation of the vessel's certificate. The desirability of conducting these tests and examinations at the regular inspection period should be obvious to the owners, but it must be recognized that the demands and changes to a ship's schedule may prompt an owner to depart from this desired practice. However, by doing so, the owner does not become immediately liable for any penalty other than the inconvenience he will incur at some later date. The reinspection program should serve to curb any delinquency in this phase of inspection. In addition, the master shall be reminded of his responsibility to replace or service items of vessel equipment at the time due (see 46 CFR 31.10-18, 97.15-60, and 196.15-60).

30-7-25. RECORDING OF VESSEL REINSPECTIONS

30-7-25A. CERTIFICATES OF INSPECTION

Mid-period reinspections of tank, cargo, miscellaneous, and oceanographic vessels shall be recorded on the Certificate of Inspection (Forms CG-841, CG-3753, or CG-4678, as applicable) in the space provided.

30-7-25B. INSPECTION RECORDS

All reinspections shall be reported to Commandant (G-MVI) by entries on Form CG-3821 (MVI Inspection Record). (Reinspections at the time of drydocking need only be reported separately on Form CG-3821 when the reinspection is to be credited as the mid-period reinspection for cargo, tank, oceanographic, and miscellaneous vessels holding 2-year certificates.) An entry concerning the reinspection shall also be made on Form CG-2832, Vessel Inspection Record, which is in the vessel's pilothouse.

30-7-25C. CG-840 INSPECTION BOOKS

Reinspections shall normally be recorded on the appropriate Form CG-840 series inspection booklet by the inspector. When the reinspection is of lesser scope, such as correcting specific discrepencies, a special examination form developed by the local OCMI may be used to record the circumstances of the examination for his records.

When a reinspection of a tank, cargo, oceanographic, or miscellaneous vessel is held in conjunction with a drydocking, but is not of the scope of a mid-period reinspection, the circumstances of the examination may be recorded by appropriate entries in the Form CG-840H booklet (Drydock Examination Book) at the discretion of the OCMI. The entry "limited reinspection indicates satisfactory condition," if appropriate, may serve the purpose in such cases. See 30–7–25B for the reporting of inspections to Commandant (G-MVI).

▼30–7–30. OPERATIONAL INSPECTIONS OF TANK VESSEL PUMPROOMS

In addition to the scheduled inspections for certification and reinspections of tankships and tank barges, it is necessary that random inspections of tank vessel pumprooms be made to identify hazards, observe regulation compliance, and collect information concerning problems found. Therefore, each OCMI shall institute and maintain a program whereby qualified inspectors randomly board U.S. flag tankships and tank barges to observe material conditions and pumproom activities while the vessel is engaged in normal transfer operations.

Deficiences discovered during an operational inspection, and the corrective action taken, shall be reported to Commandant (G-MVI) on Form CG-3821, MVI Inspection Record. In addition, the total number of inspections conducted each month shall be entered in Section III of the Report of Material Inspections, Form CG-2801.

PART 30-8--DRYDOCK EXAMINATIONS

30-8-1. DRYDOCKING REQUIREMENTS

The interval between required drydockings of vessels is specified in the regulations (see section 30-8-5B). These regulations specify that vessels must be drydocked in accordance with applicable regulations except for extensions as authorized by the Commandant. The Commandant has delegated this authority to the district commanders, and to the OCMI's under certain conditions. District commanders may extend the drydock interval requirement for any vessel for a period of up to one year. OCMI's may extend the drydock interval for barges and all vessels less than 100 G.T. for a period of up to one year, and for all other vessels for a period of up to six months. Upon the granting of an extension the Certificate of Inspection (COI) shall be amended accordingly. The only requests which should be referred to Commandant (G-MVI) are those in which unusual circumstances exist or where there may be questions as to the propriety of granting the extensions.

30-8-5. REFERENCES

30-8-5A. SOLAS

Regulation 7, Chapter I of the 1974 SOLAS Convention requires a survey of the outside of a passenger ship's bottom before the vessel is placed in service, and once every 12 months thereafter. This requirement is reflected in the passenger vessel regulations.

30-8-5B. REGULATIONS

The requirements for drydocking of vessels are prescribed in the following regulations:

- Tank Vessels - 46 CFR 31.10-20;
- Cargo & Miscellaneous Vessels - 46 CFR 91.40-1;
- Passenger Vessels - 46 CFR 71.50-1;
- Small Passenger Vessels - 46 CFR 176.15;
- Public Nautical Schoolships - 46 CFR 176.15;
- Oceanographic Vessels - 46 CFR 189.40.

30-8-10. SCOPE OF EXAMINATIONS

30-8-10A. GENERAL

The examination of a vessel while it is out of the water, and when all normally submerged parts are visible, is a vital part of the vessel inspection program. Since vessels are required to be certificated in many cases by OCMI's whose inspectors have not had an opportunity to sight the underwater body, it is essential that every drydock examination be as complete and detailed as the circumstances permit.

30-8-10B. EXAMINATION FOR CREDIT

In order to satisfy the minimum requirements of the regulations that a drydock examination be held within the stated intervals, a complete examination of the vessel's underwater body, outboard fittings, and all parts not normally accessible when the vessel is afloat, shall be carried out by an inspector while the vessel is on drydock. All vessels on drydock shall be cleaned and their fittings shall be opened to the extent necessary for the inspector to be able to determine the condition of the underwater body and underwater fittings.

When a vessel is normally drydocked more frequently than the interval required by the regulations, the amount of preparation and opening of fittings may be varied as long as sufficient records are maintained by the OCMI, or are available to him, to show that a complete inspection has been conducted within the required interval. A drydock examination of a vessel for credit, whether accomplished in one examination or several, shall consist of a careful examination of all accessible parts of the vessel's underwater body, through-hull fittings, and other items indicated in Form CG-840H (Drydock Examination Book). NVC 7-68 contains information and guidelines to be used in judging the condition of steel hulls.

Past casualties have called attention to the need for the examination of fittings in the underwater hull which might be hidden by keel blocks. When it is known that docking plugs are fitted in a ship's hull, the inspector shall ensure that they are sighted when the vessel is in drydock.

30-8-10C. DRYDOCKING IN EXCESS OF REQUIREMENTS

When a vessel is placed on drydock for the purpose of effecting repairs to the underwater body or fittings, or for other purposes, and such drydocking is in excess of the requirements of the regulations, an examination shall normally be made by the inspector. This examination shall be sufficient to determine that any repairs are adequate and that the vessel is safe for continued operation. The inspector shall determine whether the owner desires that an examination for credit be held, and, if so, a complete examination shall be held. If the drydocking is not for full credit, the inspector shall examine the underwater hull structure and fittings to the fullest extent practicable under the circumstances.

Nothing in this manual is intended to limit the inspector in carrying out such reasonable inspections or requiring such reasonable cleaning or opening of fittings, etc., as he deems necessary to determine that the vessel's condition is safe for continued operation. However, arbitrary requirements for the cleaning or opening of fittings are not desired.

For those passenger vessels inspected under Subchapter T, it is not intended that an inspector be in attendance at every drydocking. However, an inspector shall be in attendance at each of the periodic drydockings required by 46 CFR 176.15. The regulations in 46 CFR 176.15-10 do not contemplate an examination of these vessels when they are placed in drydock for the purpose of minor repairs, such as changing a propeller, painting, or cleaning of the hull.

30-8-10D. EXAMINATION OF TANK VESSELS

30-8-10D(1). General. Attention has been focused upon certain conditions found on tankships built prior to 1946. This attention has principally resulted from casualties which have occurred, from information which has been furnished to the Coast Guard through crew complaints, and from subsequent examinations of particular ships conducted by Headquarters representatives. Several aggravated instances of unsatisfactory conditions have been discovered. Major unsafe or unsatisfactory conditions found on older ships include the following:

(a) Deteriorated underdeck and side shell longitudinals;

(b) Fractures in bottom transverses, bilge brackets, and web frames;

(c) Severe general wastage of internals in compartments used exclusively for ballast or as cofferdams;

(d) General wastage by corrosion of deck piping, expansion trunks, and pipe brackets; and

(e) General wastage and severe binding of the required remote-control reach rods.

The above conditions, coupled with observations of the general overall condition of several older ships, indicate that the scope and caliber of inspections have been unsatisfactory in some cases.

30-8-10D(2). Internal Examinations. The basic requirement is that all tank interiors of all tank vessels shall be examined either during the vessel's drydocking period, at some other time between inspections for certification, or at the time of inspection for certification. This requirement shall be emphasized and expanded to include all internal spaces of ocean and coastwise tankships, with the exception of fresh water tanks and ship's fuel tanks. The scope of inspections at the time of drydocking, inspection for certification, and mid-period reinspection, in order to facilitate proper "follow-up" and ensure complete coverage, shall be recorded as follows:

(a) Signed entries shall be made under "Remarks" in the form booklets CG-840A and CG-840H indicating each internal compartment which was not examined and the reason therefor;

(b) Signed entries shall be made on Form CG-2832, Vessel Inspection Record, indicating each internal compartment which was examined.

In all cases, all gas-free compartments of ocean and coastwise tankships shall be examined internally at the time of vessel's drydocking, during inspection for certification, and during mid-period reinspections. If, at the time of drydock examination, the OCMI is not satisfied that all interior compartments (except fresh water and ship's fuel tanks) of the ship concerned were examined at either the previous inspection for certification, the mid-period reinspection conducted since last inspection for certification, or other inspection held during the interim, an appropriate gas-freeing requirement shall be made if necessary to permit such examination. If necessary, OCMI's shall contact other OCMI's to obtain appropriate records in order to fully ensure that internal compartments are examined as required.

In addition to carrying out the above requirements, OCMI's shall take such steps as are deemed necessary to insure that thorough examinations are made pertinent to all conditions described in paragraph 30-8-10D(1) above. Particular care shall be taken in the examination of all structural members and all areas subject to wastage by corrosion resulting from the cargoes carried and salt water.

30-8-10E. INSPECTION OF TANK BARGES

30-8-10E(1). General. Many tank barges are not gas-free at the time of inspection for certification, thus access to and inspection of the internal structure in way of the cargo tanks is not possible at that time. Since these tanks are normally gas-freed when the barge is drydocked, the frequency of internal examinations for tank barges inspected under 46 CFR, Subchapter D shall coincide with the requirement for drydocking. An exception is the frequency of the internal examination for a tank barge whose Certificate of Inspection limits the product to be carried to grades D & E or asphalt cargoes. OCMIs may accept internal inspections for each alternate drydocking on double hulled tank barges certificated under Subchapter D. If the cargo tanks are externally framed only the exterior surface of the tank need be examined and the tank internal inspection may be postponed until the next required drydocking. The drydocking of tank barges shall be in accordance with 46 CFR 31.10-20.

30-8-10E(2). Internal Examinations. Subchapter D specifies internal examination intervals for tank barges carrying certain specific cargoes. When the interval is not specified by regulations, internal examinations on vessels certificated solely under Subchapter D shall be conducted in accordance with the following schedule:

Salt Water Service.

Drydock	Cargo	Internal
2 years	all except D & E or asphalt	2 years
2 years	D & E	6 years
2 years	asphalt	10 years

Fresh Water Service.

Drydock	Cargo	Internal
3 years	all except D & E or asphalt	3 years
3 years	D & E	6 years
3 years	asphalt	12 years

NOTE: Barges certificated solely under Sub. D qualify for an internal examination interval of four years providing they meet the following conditions:

- Such barges must be on one-year drydocking schedules; these drydockings should be scheduled in conjunction with the inspection for certification and the mid-period examination;

- The Certificate of Inspection shall be endorsed to limit the cargo allowed to "Crude Oil of Grade B and below and other products of Grade D and below."

Vessels certificated under 46 CFR, Subchapter O shall have internal inspections in accordance with 46 CFR 151.04-5.

30-8-10E(3). Extensions. Extension requests may be authorized in accordance with subpart 30-8-1 of this manual.

30-8-15. INSPECTION PROCEDURES

The inspector shall normally conduct the drydock examination of a vessel in the company of a vessel representative (port engineer, ship's officer, etc.). Deficiencies in the condition of the vessel's hull or its fittings shall be called to the attention of the owner's representative at once. When deemed necessary, the inspector shall present the requirements in writing on CG-835.

When practicable, the Coast Guard drydock examination of the vessel shall be coordinated with surveys made by other interested parties or agencies, such as the vessel's master, the owner's representative, a classification society surveyor, an insurance underwriter, shipyard representatives, etc. Free discussion of the conditions and alternate methods of repair among this group should result in the accomplishment of adequate repairs with the least disagreement over method and extent. The Coast Guard inspector must remain aware, however, of the statutory responsibility to see that necessary repairs are accomplished so that the vessel can operate safely. In controversial or unusual cases, cases of severe damage, and cases beyond the experience of the inspector, the OCMI shall be notified of the circumstances as soon as practicable.

NVC 7-68 contains notes on the repair of steel hulls; NVC 1-63 contains notes on inspection and repair of wooden hulls. Inspectors shall use the recommended procedures in these circulars as a guide. These circulars also contain notes on inspection of vessels for deterioration and general notes on repairs that can be applied.

30-8-20. TAILSHAFT SURVEYS

30-8-20A. EXAMINATION REQUIREMENTS

Propeller tailshafts are required by the following regulations to be drawn at a stated interval:

- Ocean and Coastwise Vessels - 46 CFR 61.20-15;
- Small Passenger Vessels - 46 CFR 176.15-5;
- Public Nautical Schoolships - 46 CFR 167.15-50.

These regulations also permit the district commander to grant a delay in the drawing of tailshafts if the circumstances warrant it.

30-8-20B. INSPECTION PROCEDURES

When the tailshaft is drawn for examination, its condition shall be determined by the inspector. Special attention shall be given to detection of any fractures in way of the keyway and liners and fractures in the liners themselves. The stern bushing (after bearing) shall also be carefully examined for its condition, and the bearing shall be replaced or rebushed, if necessary. At every drydock inspection, the inspector shall require that the amount of wear in the after tailshaft bearing be determined. When the clearance exceeds the limits established in 46 CFR 61.20-15 for ocean or coastwise vessels, or the wear is otherwise excessive on any vessel, the inspector shall require that corrective action be taken. It should be noted that 46 CFR 61.20-15 applies only to vessels operating on ocean or coastwise routes. There are no comparable Coast Guard regulations for vessels on routes other than ocean or coastwise.

For those vessels operating on the Great Lakes, the standards in the American Bureau of Shipping (ABS) publication Rules for Building and Classing Steel Vessels may be used as a guide in determining the limits of weardown of the stern tube and strut bearings. These rules permit an additional 1/16" weardown when the shaft diameter is 12 inches or less, and an additional 1/8" weardown when the shaft diameter exceeds 12 inches. There is no objection to using the ABS Rules for Great Lakes Vessels as a guide in determining the limits of weardown for other vessels on inland routes. It should only be used as a guide, however, and should not be considered as a mandatory requirement that corrective action be taken when these limits are exceeded, nor that weardown must be permitted to reach these limits. The requirement for corrective action on inland vessels shall be determined by the OCMI and will depend on the route, diameter of shaft, type of bearing, and other safety factors involved.

For small passenger vessels inspected under Subchapter T, there is no requirement for periodic drawing of the tailshaft and there is no limit concerning weardown specified in the regulations. 46 CFR 176.15-5(a) does require that the inspector investigate the condition of the tailshaft and stern bearing to the extent necessary to determine that they are in satisfactory condition for the service intended.

30-8-20C. TAILSHAFTS WITH NON-CONTINUOUS LINERS

For the purpose of determining the interval at which a tailshaft must be drawn under 46 CFR 61.20-15, tailshafts having a non-continuous bronze liner may be considered in the same light as if they had continuous liners, if the sections are joined as follows:

(1) The gap between the bronze liners must be 1" or less; and

(2) The connection between the two bronze liners must be made of vulcanized rubber (or synthetic rubber) which is reinforced between layers.

30-8-20D. TAILSHAFT REPAIRS

See section 30-5-50C of this manual for a discussion of welding repairs to tailshafts.

30-8-20E. MODU EXAMINATIONS

MODU tailshafts should be examined during each credit underwater special examination, and an examination procedure should be included in the special plan submitted by the owner in accordance with 46 CFR 107.265 and 107.267. For wooden or rubber bearings, a hole in the top of the rope guard and a suitable gauge or wedge should be provided for checking the clearance.

For oil-lubricated bearings, a means for insuring that the oil seal assembly is intact and for checking the clearance of the stern bearing shall be provided.

- Weardown can be checked by depth gauge wells outboard of the seals; and

- Records of the base depths shall be maintained on board the vessel. If the stainless-steel sleeve is renewed or machined, the base readings shall be reestablished.

During the special examination plan approval process, the OCMI shall require any additional tests or examination requirements which he deems necessary to insure satisfactory condition of the tailshaft(s).

30-8-25. RUDDER ASSEMBLIES

30-8-25A. RUDDER STOCKS

Certain vessels of the C-3 type were equipped with rudder stocks of cast steel with the stock cast integral with the upper palm. In some cases, cracks have been detected just above the rudder stock palm apparently due to the short fillet. In one or two cases, these cracks have progressed to the point where a complete fracture has occurred. From available information, the incidence of fracture in these steel rudder stocks has not been serious enough to warrant rejection of the design.

At drydock inspections of C-3 type vessels equipped with rudder stocks of cast steel, particular care shall be taken by the inspector to determine if fillet cracks are starting in the forward end of the upper rudder stock palm assembly. If such cracks have started, corrective repairs or replacement shall be required. Corrective repairs can be effected in some instances if the casting is of homogeneous structure (but this is not generally true of wartime material). In most cases, replacement stocks should be forged rather than cast material.

30-8-25B. PINTLE, RUDDER, AND RUDDER POST DEFECTS

30-8-25B(1). Vessels Having Semi-balanced Rudders (Without Rudder Posts). One recent loss of this type of rudder is believed to have occurred as a result of the lower pintle fracturing during a period of heavy weather, resulting in the loss of the entire rudder below the rudder stock palm. The lower pintle and nut were missing in their entirety and the upper pintle was bent. More recently, a vessel having a rudder and pintle arrangement similar to that on a T-2 type vessel lost her rudder. Investigation revealed that the lower pintle had broken off completely just below the securing point.

In view of these casualties, when a pintle is found loose or is withdrawn for any other reason, it should be examined by magnetic particle testing or other suitable method, particularly adjacent to the sleeve and between the threads and the small end of the taper. In the course of a drydock examination, the condition of the pintle bushings, sleeves, nuts, and locking devices should be carefully examined as far as is practicable. The discovery of a loose pintle would, for example, certainly justify its removal for further examination and verification of proper fit.

The arrangements of the pintle locking devices should be such that the pintle cannot work free. In at least one instance, the pintle had backed-off and left the nut securely held in place by a clip welded to the rudder frame casting. It is essential that the nut be positively secured to preclude "turning" of the pintle. In general, these examinations involve T-2 type vessels but should also be considered during the examination of all vessels having similar rudder arrangements.

30-8-25B(2). Vessels Having Rudder Posts. Fractures have been found, upon examination at close range, in the rudder post casting just above or below the gudgeons. Similar fractures have been found in the rudder frame casting. In some cases, the fractures in the rudder post extend from or into the core-hole closing plates on the after side of the rudder post.

During the regular drydock examination, the rudder frame casting and the rudder post casting shall be carefully examined at close range for possible fractures. When conditions are suspect, the rudder post casting should be test drilled about 6" above the welded joint to determine if water has entered the rudder post. Should water be found in the rudder or fractures found in the vicinity of the rudder frame gudgeons, a portion of the rudder side plating should be removed for examination of the cast rudder frame arms to which the horizontal diaphragms are attached. Particular attention shall be directed to the casting at the mid-height of the rudder.

In general, these examinations involve C-3 type vessels but should be considered during the drydock examination of all vessels having similar rudder arrangements.

30-8-30. CASUALTIES RELATED TO SEA CONNECTIONS

30-8-30A. WASTED SPOOL PIECE

A past casualty emphasizes the need for careful inspection of all sea connections and their attached fittings while a vessel is undergoing an inspection for certification, a reinspection, or a drydock examination. A 3-inch nipple spool piece on the sanitary system sea chest of a vessel wasted away and caused a casualty costing the Government approximately $1 million, as a result of damage caused by the introduction of water into the vessel's engineroom. In the inspection of any vessel, it is imperative that all sea connections be thoroughly examined and determined to be in good condition, even if a drydocking is required to accomplish this. Particular attention shall be directed to piping and fittings installed between the sea valve and the sea.

30-8-30B. CONDENSER WATER BOXES

Upon investigation of a vessel casualty which resulted in the sinking of the ship, it was determined that the outlet water box of the main condenser had ruptured. This rupture resulted in a hole, 18" to 24" in diameter, which allowed a stream of water approximately 20" in diameter to flow unrestricted into the engineroom (approximately 20,000 GPM). Attempts to close the overboard and sea valves (24" gate valves), which required two men to make 40-50 turns on each valve to close, were unsuccessful due to the rapid flooding. Approximately five minutes after the casualty, the engineroom was abandoned with these valves only partially closed.

The condenser water boxes had been opened and examined by ship's personnel only six weeks before this casualty. Eight months before this casualty, they had been painted with apexior. The last inspection for certification on this vessel had been made 16 months before the casualty. Neither ship's personnel nor the inspector had noted any defects, and the condition of the water boxes was considered good.

Within a few months of this casualty, another vessel was inspected by the Coast Guard after a complaint of a defective condenser water box. The main condenser water box was found to be pinholed and had two brass plate patches and a 20" x 18" x 6" deep cement patch attached to it. Both of these vessels were built in the 1940's and available records indicated that the water boxes had not been replaced since the vessels were commissioned. Considering the age of these installations and the potential danger resulting from such a casualty, it is essential that the water boxes of all main condensers on vessels be given close examination at frequent intervals by ship's personnel and Coast Guard inspectors.

At all inspections for certification, and at mid-period reinspections of cargo ships and tankships, the inspector shall determine whether the water boxes of condensers are in a safe condition by an external examination of these water boxes for patches, temporary repairs, or other obviously poor conditions. In addition, the inspector shall inquire of operating personnel the extent of inspections they have made and the conditions they have found. In those cases where conditions so warrant, the inspector shall also make internal examinations or other tests of condenser water boxes to verify that they are in good condition or to require the repairs necessary to put them in good condition.

30-8-35. DRYDOCKING IN FOREIGN YARDS

From time to time, vessel owners submit requests to the Commandant for the crediting of foreign drydockings toward meeting requirements of the regulations, even though no inspection by a Coast Guard inspector was possible. These requests are normally denied, but in certain unusual cases the Commandant has given special consideration to the circumstances of the drydocking and has authorized the OCMI to grant extensions of time in which to effect permanent repairs or credit for the drawing of a tailshaft. In the interest of safety, such extensions of time are discouraged, and each case will be given individual consideration by the Commandant. Commandant (G-MVI) will give special consideration to emergency foreign drydocking in unusual cases when a written request is received from the vessel owner or representative. This request must contain the following:

(1) Evidence that the drydocking was performed due to emergency conditions and was not for routine repairs, cleaning, or inspection;

(2) Documentary evidence that the vessel's underwater hull and fittings were in a good condition at the completion of the drydocking. Normally, a certified copy of the classification society report of the drydocking should be submitted to indicate the inspections made, conditions found, and repairs accomplished.

Upon receipt of such a request, Commandant (G-MVI) may authorize the OCMI to grant extensions of time in which to drydock the vessel, provided that the OCMI is satisfied, after a review of the evidence presented and after an examination of accessible parts of the vessel, that the vessel can continue to operate safely. Under the same conditions, the OCMI may grant extensions of time in which to accomplish permanent repairs. Such extensions of drydock periods or extensions of time in which to accomplish permanent repairs shall be for a definite period and shall be in writing.

It is not the intention of Commandant (G-MVI) to establish a policy of accepting classification society reports on routine drydocking or tailshaft examinations made in foreign countries.

30-8-40. RECORD OF DRYDOCKINGS

30-8-40A. FORM CG-840H

All drydock examinations shall be recorded in the Drydock Examination Book, Form CG-840H. The instructions for completing the book shall be closely followed, particularly with regard to a description of unsatisfactory conditions found. It should be noted that items 20 and 21 in Form CG-840H require an indication of sea valves, sea chests, and through-hull fittings which were opened at the drydock inspection. It is intended that this record be used at subsequent drydockings to determine which fittings should be required to be opened and cleaned for inspection. To accomplish this intent, it will be necessary to obtain records from other OCMI's in some cases.

30-8-40B. FORM CG-2832

Drydock examinations shall be recorded on Form CG-2832, Vessel Inspection Record, on vessels that have this form on board.

30-8-40C. FORM CG-3821

Drydock examinations shall be reported to Commandant (G-MVI) on Form CG-3821, MVI Inspection Record.

30-8-40D. CERTIFICATES OF INSPECTION

Each drydocking during which an examination for credit is made by a Coast Guard inspector shall be recorded by an entry on the applicable COI or Certificate of Inspection Amendment, Form CG-858. The date of the drydocking shall be shown. When a tailshaft is drawn for inspection by the Coast Guard, the date when the tailshaft is next due to be drawn shall be entered on the COI or COI Amendment.

PART 30–9—INSPECTIONS UNDER SOLAS

30–9–1. GENERAL

30–9–1A. VESSELS TO WHICH SOLAS 60 IS APPLICABLE

Mechanically propelled cargo and tank ships of 500 gross tons and over and all mechanically propelled passenger ships, regardless of size, which are engaged on international voyages and which are registered in countries acceding to the International Convention for the Safety of Life At Sea, 1960 (SOLAS 60), are subject to this Convention to the extent described therein. When in possession of a current valid convention certificate and in compliance with the terms of the certificate, these vessels are entitled to all of the privileges described in the Convention when visiting in foreign countries which are signatory to the Convention.

The SOLAS 60 Convention applies to U.S. vessels registered in the United States, Guam, the U.S. Virgin Islands, and Puerto Rico (other than those operating exclusively on the Great Lakes). The term "ships registered," when used in determining vessels subject to the Convention, is not defined in the Convention and must be taken to have been used in its ordinary meaning—that the ship possesses a document issued under the laws of the flag country. It is intended that the term "ships registered" in the Convention, insofar as it applies to private merchant vessels, be considered applicable only to those American vessels which are registered under the Registry Acts (46 U.S.C. 11 *et seq.*).

Vessels numbered under the provisions of the Federal Boat Safety Act of 1971 (46 U.S.C. 1451 *et seq.*) are not considered to be "registered" for the purpose of determining the application of the SOLAS 60 Convention.

30–9–1B. EFFECTIVE DATE OF CONVENTION

The requirements of the SOLAS 60 Convention were placed into effect on 26 May 1965. For the purpose of the Convention, a new ship means a ship, the keel of which is laid on or after 26 May 1965. An existing ship is one for which the keel was laid before 26 May 1965.

▼30–9–1C. APPLYING SOLAS 60

With the ratification of the SOLAS 60 Convention, the United States Government, under Article I of the Convention, agreed to promulgate all laws, decrees, orders, and regulations and to take all other steps necessary to give the Convention full and complete effect, so as to insure that, from the point of view of safety of life, a ship is fit for the service for which it is intended.

The navigation and vessel inspection laws are used as authority to enforce the terms of the Convention and no special law was necessary to place the requirements of the Convention which are administered by the Coast Guard into effect. The regulations which require compliance with the Convention have been promulgated under the authority of these laws. The vessel inspection regulations in title 46 of the Code of Federal Regulations contain all of the inspection requirements of the Convention. Thus, vessels inspected and found to be in compliance with the applicable regulations in the various subchapters of title 46 CFR will automatically be in compliance with the inspection requirements of the Convention (other than radio equipment requirements administered by the FCC).

Inspectors will not normally find it necessary to refer to the Convention requirements during the inspection of a vessel for certification. They shall be thoroughly familiar with the terms of the Convention, however, so that its requirements may be fully considered in making inspection decisions, and in particular, when relaxations of normal inspection requirements are at issue.

The regulations in 46 CFR Subchapter T for small passenger vessels do not reflect the requirements of the SOLAS 60 Convention except by reference to the Convention. For those small passenger vessels operating on international routes, it will be necessary for the inspector to apply the current SOLAS Convention requirements or recommend that SOLAS Exemption Certificates be issued.

OCMI's who certificate small passenger vessels that will operate on short international voyages in another OCMI's zone should contact the OCMI in whose zone the vessel will operate to determine if any additional requirements are necessary.

30-9-1D. SOLAS 1929 AND SOLAS 1948

The International Convention for Safety of Life At Sea, 1929, was replaced by the 1948 Convention, and the 1948 Convention was replaced by the 1960 Convention. Certificates of the 1929 and 1948 Conventions are no longer recognized by the Coast Guard as granting privileges to foreign vessels.

It should be noted that the terms of the 1929 and 1948 Conventions are not significant in the present inspection of a vessel, even though the vessel may have once met the requirements of those Conventions. However, as a practical application, a vessel which once complied with the requirements of a previous Convention, whichever was applicable, should be required to be maintained so as to comply with that Convention. All vessels built before 26 May 1965 must be evaluated on the basis of whether or not they meet the requirements of the SOLAS 60 Convention for existing vessels.

30-9-1E. 1966 FIRE SAFETY STANDARDS FOR PASSENGER VESSELS

As a result of several disasters aboard foreign passenger ships, Congress passed Public Law 89-777 (46 U.S.C. 362(c)). This law provides that certain foreign and domestic passenger vessels may not depart a United States port with passengers who are U.S. nationals and who embarked at that port, if the vessels do not comply with the standards of th SOLAS 60 Convention as modified by the amendments proposed by the 13th session of the Maritime Safety Committee of the Intergovernmental Maritime Consultative Organization (IMCO). The proposed amendments (1966 Fire Safety Standards for Passenger Vessels) were adopted without substantial change by the General Assembly of IMCO on 30 November 1966. The 1966 Fire Safety Standards were to become effective when the proposed amendments to SOLAS 60 came into force (twelve months after the date on which the amendments are accepted by two-thirds of the contracting governments including two-thirds of the governments represented on the Maritime Safety Committee). However, P.L. 89-777 provided that "not later than 2 November 1968, the fire safety standards would become effective as to all foreign and domestic vessels of over 100 gross tons having berth or stateroom accommodations for 50 or more passengers, departing from a U.S. port, with passengers who are U.S. nationals who embarked at that port."

The additional requirements necessary for a U.S. vessel to meet the 1966 Fire Safety Standards have been incorporated in title 46 of the Code of Federal Regulations. The additional requirements applicable to foreign vessels which are subject to SOLAS may be found in Part C (Fire Protection Equipment) of Form CG-840F, Control Verification or Examination of Foreign Vessel.

30-9-1F. 1967 FIRE SAFETY STANDARDS

On 25 October 1967, the IMCO General Assembly adopted Resolution A.122(V) which proposes new fire safety standards for newly constructed passenger vessels. The 1967 proposed rules are optional until ratified but may be used in lieu of the 1966 standards required by 46 U.S.C. 362(c). The 1967 Fire Safety Standards are contained in NVC 1-75.

30-9-1G. SOLAS 1974

(To be developed.)

30-9-5. REFERENCES

30-9-5A. INTERNATIONAL CONVENTIONS AND CONFERENCES ON MARINE SAFETY, CG-242

This publication contains the text of the SOLAS 48 Convention, a summary of the Committee reports on the conference, and background information concerning the conference. It is for official use only and cannot be purchased at the Government Printing Office by the public. However, copies shall be maintained at each unit as required by the *Directives, Publications and Reports Index* (CG-236). The SOLAS 1948 Convention is of assistance when applying the 1966 Fire Safety Standards.

30-9-5B. MARINE SAFETY MANUAL, CG-495

Chapter 2 of this manual contains information on the SOLAS Conventions and the authorities which place them in effect. Chapter 32 contains instructions concerning the inspection and control of foreign vessels under the SOLAS 60 Convention.

30-9-5C. IMPLEMENTING REGULATIONS

The requirements of the SOLAS 60 Convention are incorporated throughout the regulations in title 46 CFR without specific mention of the Convention. The following listed regulations are among those which make specific mention of the Convention and its application:

- All Vessels - 46 CFR 2.01-25.

- Passenger Vessels - 46 CFR 70.05-3(b)(1), 70.05-10, table 70.05-1(a) footnote 6, and 71.75.

- Cargo & Miscellaneous Vessels - 46 CFR 90.05-1(a)(1), table 90.05-1(a) footnote 6, 90.05-10, and 91.60.

- Tank Vessels - 46 CFR 30.01-5(e)(1), table 30.01-5(d) footnote 6, and 31.40.

- Small Passenger Vessels - 46 CFR 175.05-1, table 175.05-1(a) footnote 6, 175.05-1(c), and 176.35.

- Oceanographic Vessels - 46 CFR table 188.05-1(a) footnote 6, 188.05-10, 188.10-35, and 189.60.

30-9-5D. COMMANDANT INSTRUCTIONS

Commandant Instruction 16702.1 (series) contains a list of the countries which have ratified the SOLAS 60 Convention and other international conventions.

30-9-10. CERTIFICATES ISSUED UNDER SOLAS 60

30-9-10A. U.S. FLAG VESSELS

All United States flag vessels subject to SOLAS 60, which are inspected and found to be in compliance with the applicable vessel inspection regulations, shall be issued Convention Certificates in accordance with Chapter I, Regulations 12 through 20, of the Convention. The certificates issued are:

(1) Passenger Ship Safety Certificate (Form CGHQ-968). This form is issued by Commandant (G-MVI).

(2) Cargo Ship Safety Equipment Certificate (Form CG-3347). This Form is issued by the OCMI to cargo, tank, and miscellaneous vessels.

(3) Cargo Ship Safety Construction Certificate (Form CG-4359). This Form is issued by the OCMI to cargo, tank, and miscellaneous vessels. However, the American Bureau of Shipping (ABS) is also authorized to issue a Cargo Ship Safety Construction Certificate if the vessel's owner so requests.

(4) Nuclear Passenger Ship Safety Certificate. This form is issued to nuclear passenger vessels by Commandant (G-MVI).

(5) Nuclear Cargo Ship Safety Certificate. This form is issued to nuclear cargo, tank, and miscellaneous vessels by Commandant (G-MVI).

(6) Safety Radiotelephony Certificate. This form is issued by the Federal Communications Commission (FCC) to cargo, tank, and miscellaneous vessels fitted with radiotelephone installations.

(7) Safety Radiotelegraph Certificate. This form is issued by the FCC to cargo, tank, and miscellaneous vessels fitted with radiotelegraph installations.

(8) Exemption Certificate (Form CGHQ-967). These certificates are considered to be a part of the Convention document which they modify. The Coast Guard will only issue Exemption Certificates in conjunction with a Passenger Ship Safety Certificate or a Cargo Ship Safety Equipment Certificate as follows:

(a) Exemption Certificates are issued to passenger vessels only by Commandant (G-MVI) through the cognizant OCMI. An Exemption Certificate modifying that part of the Passenger Ship Safety Certificate covering radiotelegraphic installations (Part V) will be issued only upon receipt of a request for such issuance from the Federal Communications Commission. These exemptions will not be issued, however, unless the vessel has been inspected by the Coast Guard and found to qualify for a Passenger Ship Safety Certificate.

(b) Exemption Certificates are issued to cargo, tank, and miscellaneous vessels only by Commandant (G-MVI) through the cognizant OCMI to modify the Cargo Ship Safety Equipment Certificate.

(c) Exemption Certificates are issued to cargo, tank, and miscellaneous vessels by the FCC to modify the Safety Radiotelephony Certificate or the Safety Radiotelegraphy Certificate.

30-9-10B. FOREIGN VESSELS

Convention certificates may be issued to foreign vessels in the same manner as convention certificates are presently issued to United States vessels with the exception that such certificates will be issued only upon request of the Consular Representative of the country in which the vessel is registered. Every convention certificate issued to a foreign vessel shall contain a notation as to the person representing the government of the country in which the vessel is registered who requested that the certificate be issued.

The issuance of Form CG-4504, Control Verification for Foreign Vessel, to foreign vessels having Convention Certificates is outlined in chapter 32.

30-9-10C. AMENDMENTS TO CONVENTION CERTIFICATES

Although the SOLAS 60 Convention makes no provisions for the amendment of a convention certificate, it is expected that they be corrected as necessary to reflect changes made in the items recorded on the certificate. When a Certificate of Inspection is amended, the convention certificate should also be reviewed for accuracy. Any corrections necessary shall be made by withdrawing the old certificate and reissuing a corrected certificate with the same expiration date. In the case of a Passenger Ship Safety Certificate, the corrected copy shall be requested from Commandant (G-MVI).

When changes are made to the amount of equipment carried, such as the replacement of a lifeboat, and the vessel is still in compliance with the requirements of the Convention, no correction to the convention certificate is necessary.

30–9–15. APPLICATION FOR CONVENTION CERTIFICATES

30–9–15A. APPLICATION TO OCMI

The master, owner, or agent of a vessel for which a Passenger Ship Safety Certificate, Cargo Ship Safety Equipment Certificate, Cargo Ship Safety Construction Certificate, or Exemption Certificate is desired, shall indicate on Form CG-3752 (Application for Inspection of U.S. Vessel) the convention certificate(s) desired. They shall also indicate whether the Coast Guard or the American Bureau of Shipping will issue the Cargo Ship Safety Construction Certificate.

30–9–15B. APPLICATION TO FCC

The master, owner, or agent of a vessel for which a Safety Certificate, Safety Radiotelegraphy Certificate, Safety Radiotelephony Certificate, or Exemption Certificate in connection with radiotelephony or radiotelegraphy installations is desired, shall submit an application to the local office of the Federal Communications Commission.

30–9–15C. ACKNOWLEDGEMENT OF APPLICATIONS

30–9–15C(1). Passenger Vessels. The OCMI shall acknowledge the receipt of an application for a Passenger Ship Safety Certificate on Form CG-969 (Notice of Receipt of Application for Safety Certificate). This form states on its face that it may be used to explain the failure of the vessel to have a Passenger Ship Safety Certificate in the event such a certificate is not on board before the ship sails on a foreign voyage.

30–9–15C(2). Cargo, Tank, and Miscellaneous Vessels. Form CG-969 shall not be used to acknowledge applications for Cargo Ship Safety Equipment Certificates. Since the Cargo Ship Safety Equipment Certificate is issued locally by the OCMI, it is intended that the certificate be issued prior to the sailing of the vessel on a foreign voyage.

30–9–20. COORDINATION OF CONVENTION INSPECTIONS WITH THE FCC

30–9–20A. PASSENGER VESSELS

30–9–20A(1). General. The inspection of a passenger vessel leading to the issuance of a Passenger Ship Safety Certificate consists of inspections by both the Coast Guard and the FCC. The Passenger Ship Safety Certificate is issued only after the Commandant has received the report of inspection from the OCMI and the FCC. Because it is desirable for the Passenger Ship Safety Certificate and the Coast Guard Certificate of Inspection to be issued for the same 12-month period and thus expire at the same time, the FCC has agreed to coordinate their inspections of the radio equipment (including lifeboat portable radio apparatus) with the inspections made by the Coast Guard.

30–9–20A(2). FCC Notification. In order to facilitate this coordination, the OCMI, upon receipt of an application for inspection leading to the renewal of a Certificate of Inspection or the issuance of a Passenger Ship Safety Certificate, shall notify the local FCC office as follows:

(a) Date on which it is anticipated that the Coast Guard inspection will be completed, or

(b) That the Coast Guard inspection will not be completed, and the vessel's Certificate of Inspection not renewed prior to the vessel's sailing for a non-international voyage in the open sea.

If it is anticipated that the Coast Guard inspection will be completed at that port, the FCC inspection will normally be carried out on the date furnished by the OCMI. When, however, there is insufficient time between the completion date of the Coast Guard inspection and the vessel's sailing date, the FCC annual inspection will be made at least one business day before the sailing date. In case (b) above, the FCC annual inspection will be made prior to the vessel's sailing if the vessel's station license certification will expire before the date of the return of the vessel to a U.S. port.

30-9-20A(3). Inspection Completion. Upon completion of its inspection, the FCC will forward a copy of its Form 806 (Certificate of Compliance with the Radio Provisions of the International Convention for the Safety of Life at Sea) to the OCMI having jurisdiction. The OCMI shall forward the completed FCC Form 806 to Commandant (G-MVI) with Form CG-969A (Notification of Approval for Passenger Ship Safety Certificate).

An Exemption Certificate modifying that part of the Passenger Ship Safety Certificate covering radio equipment will be issued only upon receipt of a request from the FCC to issue an Exemption Certificate. The Exemption Certificate covering radio equipment will not be issued, however, unless the vessel has applied for a Coast Guard inspection and has met all the applicable requirements of the Convention administered by the Coast Guard.

30-9-20B. CARGO, TANK, AND MISCELLANEOUS VESSELS

The FCC conducts annual inspections of radio equipment including the lifeboat portable radio on board cargo, tank, and miscellaneous vessels subject to the requirements of SOLAS 60. These inspections are normally conducted at the time of the Coast Guard inspection for certification or mid-period reinspection.

30-9-25. ISSUANCE OF CONVENTON CERTIFICATES

30-9-25A. PASSENGER VESSELS

Upon satisfactory completion of an inspection for certification of a passenger vessel entitled to the privileges of the Convention and meeting the requirements of the Convention, the OCMI shall complete Form CG-969A (Notification of Approval for Passenger Ship Safety Certificate) and forward it to Commandant (G-MVI). For those vessels requiring exemptions from inspection requirements of the SOLAS 60 Convention under the jurisdiction of the Coast Guard and for which written application has been made by the master, owner, or agent, the OCMI shall list the recommended exemptions on the reverse side of Form CG-969A.

Prior to the completion of Form CG-969A, the OCMI shall ascertain that the vessel has a valid Load Line Certificate and shall obtain FCC Form 806 from the Federal Communications Commission (see 30-9-20). This Form shall be forwarded to Commandant (G-MVI) along with the completed Form CG-969A.

30-9-25B. CARGO, TANK, AND MISCELLANEOUS VESSELS

Upon the satisfactory completion of an inspection for certification of a cargo, tank, or miscellaneous vessel entitled to the privileges of the Convention and meeting the requirements of the Convention, the OCMI shall issue the vessel a Cargo Ship Safety Equipment Certificate and a Cargo Ship Safety Construction Certificate, if requested. In any case, both certificates shall be on board prior to the sailing of a vessel on an international voyage. If issued by the Coast Guard, these certificates shall be dated to expire at the same time as the vessel's Certificate of Inspection.

When exemptions to the provisions of the SOLAS 60 Convention have been requested, the OCMI shall delay the issuance of the Cargo Ship Safety Equipment Certificate until the Commandant has issued an Exemption Certificate or until the vessel has been brought into compliance with the Convention. Recommendations with respect to the requested exemptions shall be forwarded to Commandant (G-MVI) in the same manner as that provided for passenger vessels.

In order to facilitate this coordination, the OCMI shall, upon receipt of an application for inspection leading to the renewal of a COI or the issuance of a Passenger Ship Safety Certificate, notify the local FCC office of the following:

(a) The date on which it is anticipated that the Coast Guard inspection will be completed; or

(b) That the Coast Guard inspection will not be completed, and the vessel's COI not renewed prior to the vessel's sailing for a non-international voyage on the high seas.

If it is anticipated that Coast Guard inspection will be completed at that port, the FCC inspection will normally be carried out on the date indicated by the OCMI. However, when there is insufficient time between the completion date of the Coast Guard inspection and the vessel's sailing date, the FCC inspection will be made at least one business day before the sailing date. In the latter case, the FCC inspection will be made prior to sailing if the vessel's station license certification will expire before the return of the vessel to a U.S. port.

Upon completion of its inspection, the FCC will forward a copy of its Form 806, Certificate of Compliance with the Radio Provisions of the International Convention for the Safety of Life at Sea, or an FCC Letter of Exemption to the OCMI. The OCMI shall forward the FCC document to Commandant (G-MVI) along with Form CG-969A (Notification of Approval for Passenger Ship Safety Certificate) and a current copy of the vessel's COI.

An Exemption Certificate modifying that part of the Passenger Ship Safety Certificate covering radio equipment will be issued only upon receipt of a request from the FCC to issue an Exemption Certificate, when the vessel has applied for a Coast Guard inspection, and when it has met all the applicable requirements of the convention administered by the Coast Guard.

30-9-20B. CARGO, TANK, AND MISCELLANEOUS VESSELS

The FCC conducts annual inspections of radio equipment (including the portable lifeboat radio equipment) on board cargo, tank, and miscellaneous vessels subject to the requirements of SOLAS 74. These inspections are normally conducted at the time of the Coast Guard inspection for certification or mid-period reinspection.

30-9-25. ISSUANCE OF CONVENTION CERTIFICATES

30-9-25A. PASSENGER VESSELS

Upon satisfactory completion of a SOLAS inspection of a passenger vessel entitled to the privileges of the convention, the OCMI shall complete Form CG-969A, Notification of Approval for Passenger Ship Safety Certificate, for forwarding to Commandant (G-MVI). For those vessels requiring exemptions from SOLAS inspection requirements for which written application has been made by the master, owner, or agent, the OCMI shall list the recommended exemptions on the reverse side of Form CG-969A.

Prior to submission of Form CG-969A, the OCMI shall ascertain that the vessel has a valid Load Line Certificate. A copy of the FCC Form 806 (or Exemption Letter) and a copy of the vessel's Certificate of Inspection shall be forwarded to Commandant (G-MVI) with Form CG-969A.

30-9-25B. CARGO, TANK, AND MISCELLANEOUS VESSELS

Upon the satisfactory completion of a SOLAS inspection of a cargo, tank, or miscellaneous vessel entitled to the privileges of the convention, the OCMI shall issue the vessel a Cargo Ship Safety Equipment Certificate, and a Cargo Ship Safety Construction Certificate if requested. In all cases, the certificate(s) shall be on board prior to sailing on an international voyage. These certificates shall be dated to expire at the same time as the vessel's COI.

When exemptions to the provisions of SOLAS 74 are requested, the OCMI shall delay the issuance of the Cargo Ship Safety Equipment Certificate until the Commandant has issued an Exemption Certificate or until the vessel complies with the terms of the convention. Recommendations with respect to requested exemptions shall be forwarded to Commandant (G-MVI) in the same manner as that provided for passenger vessels.

30-9-30. EXTENSION OF CONVENTION CERTIFICATES BY CONSULAR OFFICERS

Regulation 14 of Chapter I, SOLAS 74 provides for the extension of convention certificates by a duly authorized officer of the issuing country if the ship is not in a port of the country of registry when its certificate expires. This extension is only for the purpose of permitting the ship to complete its voyage to the country in which it is registered or is to be inspected, and then only in cases where it appears proper and reasonable to do so. The procedure for such extension for a U.S.-flag vessel is described in the U.S. Department of State's Foreign Affairs Manual (Vol. 7, Special Consular Services) as follows:

30–9–40. SMALL PASSENGER VESSELS SUBJECT TO SOLAS 60

30–9–40A. VESSELS INSPECTED UNDER 46 CFR SUBCHAPTER T

30–9–40A(1). Drydocking. Vessels must have a drydock inspection at least once in every 12 months.

30–9–40A(2). Lifeboatage. Chapter III of SOLAS 60 requires 100% lifeboatage with the provision that the administration may permit exemptions according to the route and service. Small passenger vessels on an international voyage requiring an ocean or coastwise route may be exempted from the requirement for lifeboats provided the vessels are equipped with inflatable liferafts for 100% of the persons carried. Vessels on lesser routes may utilize lifefloats or buoyant apparatus capable of accommodating 100% of the total persons carried. In all cases, a suitable rescue boat shall be provided unless the OCMI deems this provision unnecessary.

▼***30–9–40A(3). Number of Passengers.*** Vessels carrying 49 passengers or less which are found to be in compliance with the requirements for a Certificate of Inspection will, in general, be considered as satisfactory for international voyages if the routes are so limited as to permit exemption under Regulation 1(c) of Chapter II and 3(a) of Chapter III, SOLAS 1960.

Vessels carrying more than 49 passengers on international voyages shall comply with the provisions of Chapter 2, SOLAS 1960. In view of the manning standards of 46 CFR Subchapter T, Chapter 2 of SOLAS 60 assumes greater importance and, accordingly, no major exemptions should be granted which would reduce the overall safety afforded new vessels constructed thereunder.

OCMI's who certificate small passenger vessels that will operate on short international voyages in another OCMI's zone should contact the OCMI in whose zone the vessel will operate to determine if any additional requirements are necessary.

30–9–40A(4). Certificates. A Certificate of Inspection, Form CG-3753, shall be issued for one year. A Passenger Ship Safety Certificate and Exemption Certificate will be issued annually by Commandant (G-MVI) upon receipt of Form CG-969A (Notification of Approval for Passenger Ship Safety Certificate). This form shall include the OCMI's recommendations as to exemptions and a listing of the sections of Chapters II and III of SOLAS 1960 requiring exemption. Vessels should not be permitted to operate on international voyages without the required Passenger Ship Safety Certificate and Exemption Certificate. Certificates of Inspection should be revoked if necessary to obtain compliance.

Exemption Certificates will not be issued unless a Passenger Ship Safety Certificate is also issued. Thus the Exemption Certificate requested by the FCC will not be issued until application has been made for a Passenger Ship Safety Certificate and the vessel has been inspected by the Coast Guard and found to qualify for the Safety Certificate.

The routes specified on the Certificate of Inspection, Passenger Ship Safety Certificate, and Exemption Certificate must be in agreement. If the owner requests a route from the FCC which is different from one that is indicated on the Certificate of Inspection, the Passenger Ship Safety Certificate and Exemption Certificate will be held by Commandant (G-MVI) until the matter is resolved.

PART 30-10 -- INSPECTION PROCEDURES APPLICABLE TO VESSEL TYPES, CLASSES, AND CATEGORIES

30-10-1. INTRODUCTION

This part discusses inspection methods, procedures, decisions, and interpretations that particularly apply to a vessel of a particular type, class, or category. Some of this information refers to other parts of this manual.

30-10-5. PASSENGER VESSELS.

(To be developed.)

30-10-10. SMALL PASSENGER VESSELS

30-10-10A. GENERAL

The Commandant believes that the regulatory program for small passenger vessels requires a realistic appraisal of the operational necessities of the small passenger vessel industry. As with other regulations, because of the many types of vessels and operations to be considered, it has not been possible to develop regulations which cover all situations. Under 46 CFR 175-187 (Subchapter T - Small Passenger Vessels Under 100 Gross Tons), OCMI's are authorized, and will find it necessary, to accept alternates or equivalents and to grant departures from the regulations when special circumstances warrant such actions.

In the development of the regulations for small passenger vessels (or "T-boats"), the primary considerations were that:

(1) Most of the passengers carried are unacquainted with the hazards of the sea;

(2) Overloading, fires, explosions, and lack of seaworthiness have been the basic causes of some of the more serious casualties which have occurred on uninspected passenger-carrying vessels; and

(3) There is a need for a means of escape and survival in case of casualty to the vessel.

In carrying out the small passenger vessel inspection program, there can never be an assumption made that vessel owners or operators are familiar with Coast Guard regulations and procedures. Inspection personnel must continue to communicate with them on a personal basis to explain all requirements in detail. Experience has shown that after a vessel is inspected and the requirements are understood, most of the owner's apprehension subsides.

Reports of inspection for certification and reinspection of T-boats shall include lists of all items which have required interpretations of regulations and for which interpretations have been rendered by the OCMI, the district commander, or the Commandant. Such items would include equivalents, substitutions, non-approved equipment, non-standard fuel tanks, variations from subdivision standards, etc. These notes should preclude differing requirements, and form the basis for comparison with installed items, at subsequent inspections.

30-10-10B. STATUTES

The statutes that relate to the inspection and certification of small passenger vessels are 46 U.S.C. 362, 375, 390-390g, 391, 392, 399, 404, 416, 435, and 451 (see 46 CFR 175.01-1).

30-10-10C. INSPECTION OF SMALL PASSENGER VESSELS SUBJECT TO SUBCHAPTER T

30-10-10C(1). General. Passenger vessels, if less than 100 G.T. and not exempted from inspection by 46 CFR 175.05-1, shall be inspected and certificated under Subchapter T. Vessels carrying more than 150 passengers are subject to certain additional requirements as determined by the OCMI. Such additional requirements are contained in the applicable regulations in 46 CFR, Subchapters F, H, J, and P as outlined in 46 CFR 175.05-1(b).

30-10-10C(2). Vessels Carrying Freight for Hire. Any T-boat may carry freight for hire subject to the conditions as may be imposed by the OCMI. These conditions shall include the following:

Shipping and Lloyd's Register of Shipping are the only classification societies whose standards of construction and equipment have been accepted or approved by the Commandant with respect to vessels inspected under 46 CFR Subchapter T.

30-10-10C(8). Life Ring Buoys. Previous specifications for life ring buoys in Subparts 160.009 and 160.050 of 46 CFR Subchapter Q (Specifications) required marking as follows: "For use on motorboats not carrying passengers for hire." These specifications have been changed to remove such markings as a requirement, and life ring buoys already manufactured shall not be prohibited on the basis of such markings on vessels inspected under 46 CFR Subchapter T.

▼***30-10-10C(9). Spare Fuel For Outboard Motors.*** Under the authority of 46 CFR 147.03-1, certification has been given by the Commandant for the stowage of spare gasoline on deck of small passenger vessels. This applies to vessels propelled by outboard motors as well as vessels carrying tenders, launches, etc., which are propelled by outboard motors. This certification is contingent upon satisfactory compliance with the following conditions:

- The gasoline must be carried in 6 gallon capacity steel containers, constructed so as to have a built-in ullage space.

- The gasoline container must be at least of 20 gage, welded steel construction built to withstand an internal pressure of 25 psi.

- The gasoline container shall comply with the ABYC H-25 Standard for portable fuel systems and portable containers for flammable liquids.

- Gasoline containers must be stowed in a rack on deck in a manner to facilitate effective firefighting and in an area as far as possible from areas normally transited by passengers. Particular consideration must be given to ensure that stowage is away from ventilation intakes and sources of ignition. The stowage arrangement shall be to the satisfaction of the cognizant OCMI.

- Fire extinguishing devices and their locations shall be to the satisfaction of the cognizant OCMI.

- A maximum of 10 gasoline containers is allowed on board the vessel at any given time.

- No smoking signs must be prominently displayed in the gasoline container stowage area.

- Empty gasoline containers must be handled and stowed in the same manner as full containers.

- The vessel's Certificate of Inspection must be specifically endorsed to allow for the stowage of the gasoline containers on board the vessel.

Final authority to authorize this carriage of gasoline rests with the OCMI and should be granted only after the vessel's owner documents a bona fide need for the extra fuel and meets all the control conditions.

30-10-10C(10). Application of SOLAS 60. The SOLAS 60 regulations reiterated in 46 CFR 176.35-1(d) and (e) permit the home administration to exempt vessels on certain international voyages from the provisions of the specific regulations which the administration deems unnecessary or unreasonable. In view of the standards of 46 CFR Subchapter T, Chapter II of SOLAS 1960 assumes greater importance and, accordingly, it is intended for vessels on international voyages carrying more than 49 passengers, that no major exemptions of the provisions of Chapter II be granted which would reduce the overall safety afforded new vessels constructed thereunder.

30-10-10C(11). Pollution Prevention. (To be developed.)

▼*30-10-10D. CONTROL OF UNSEAWORTHY VESSELS*

It is possible for a small passenger vessel that no longer has a valid Certificate of Inspection to be sold to a party that wishes to operate it for the carriage of more than six passengers without having it inspected and recertificated. This may be either through ignorance or through an intentional disregard for the law. This act could result in the operation of an unseaworthy vessel which, in addition to being in violation of marine inspection laws, subjects the vessel to probable casualties and loss of life. Therefore, whenever seaworthiness is a question, and (1) upon acceptance of a voluntary surrender of a small passenger vessel certificate, or (2) if the certificate is revoked or otherwise becomes invalid, the OCMI shall notify the owner in writing of the following:

(1) The vessel shall not carry more than six passengers unless it is reinspected and recertified for passenger service.

(2) If the vessel is disposed of by sale, transfer, or any other means, the former owner is requested to inform the new owner of his obligation to obtain a valid Certificate of Inspection before operating the vessel carrying more than six passengers.

(3) If the vessel is disposed of as mentioned above, the former owner is requested to notify the cognizant OCMI within 48 hours and furnish the name and address of the new owner.

(4) Continued operation or use of the vessel, for any purpose, in an unseaworthy condition may constitute negligent use under the Federal Boat Safety Act of 1971 and may subject the owner to civil or criminal penalties.

The required written notice may take the form of the sample letter found on plate 30-10-10D.1. A copy of the notification shall be placed in the vessel's file and, if the vessel is documented, a copy of the notification shall be forwarded to the vessel's port of documentation.

All OCMI's shall also maintain a monitoring program for all small passenger vessels within their zone which are determined to be unseaworthy. Coast Guard operational units and Auxiliary units should be advised of the names of those vessels within their area that are considered to be unseaworthy. This monitoring is to insure the future proper operation of these vessels in compliance with applicable laws and regulations.

To assist Coast Guard and Auxiliary personnel in this monitoring, vessels which are subject to 46 CFR subchapter T regulations are required to display a Certification Expiration Date Sticker in an easily visible location near each boarding area (see section 30-10-10I).

▼*30-10-10E. CHARTERS FOR SMALL PLEASURE BOATS*

The following discussion of charters for small pleasure boats shall be used as a guide in determining whether a vessel under a purported bareboat charter is subject to inspection. OCMI's shall refer to the district commander all cases that are not susceptible to initial clear determination. Inspection of the vessel involved shall be deferred pending the district commander's determination:

(1) In connection with the formulation of plans to carry out the provisions of 46 U.S.C. 390, considerable discussion centered on the question as to how the Coast Guard would apply the inspection requirements to pleasure vessels (yachts) under circumstances where such yachts are chartered to others, ostensibly for pleasure purposes, under conditions whereby either the owner's yacht master or the owner himself accompanies the vessel while under charter. The fundamental question to be decided in each case is whether or not the contract (charter-party) for the letting of the vessel is in fact a demise charter, or as commonly called, a bareboat charter.

(2) Under a demise or bareboat charter, the charterer takes over the vessel completely and may or may not man it with his own people. The

PLATE 30-10-10D.1
SAMPLE WRITTEN NOTICE TO THE OWNER OF A SMALL PASSENGER VESSEL

OFFICER IN CHARGE, MARINE INSPECTION
U.S. COAST GUARD

__________(Port)__________

__________(Date)__________

__________(Name)__________, OWNER

SMALL PASSENGER VESSEL ___(Name)___

__________(Address)__________

Dear Sir:

As the owner of a small passenger vessel which was formerly certificated by the Coast Guard, but which no longer has a valid Certificate of Inspection, you are hereby informed of the following:

(1) You may not operate your vessel carrying more than six passengers unless you first correct any deficiencies and have your vessel inspected and re-certificated for passenger service;

(2) If you dispose of your vessel by sale, transfer, or other means, you are requested to inform the new owner of his obligation to obtain a valid Certificate of Inspection before operating the vessel carrying more than six passengers;

(3) If you dispose of your vessel by sale, transfer, or any other means, you are requested to inform the local Coast Guard Office in Charge of Marine Inspection of the name and address of the new owner. This notification should be accomplished within 48 hours of the transfer of ownership;

(4) Continued operation or use of this vessel, for any purpose, in an unseaworthy condition may constitute negligent use under the Federal Boat Safety Act of 1971. This negligent use may subject your to civil or criminal penalties.

A copy of this letter has been placed in your vessel's official file at this office and a copy has been forwarded to the vessel's port of documentation.

Sincerely,

__(Signature)__

__(Title)__

charterer becomes in effect what is known in law as the owner *pro hac vice* (for this turn or occasion), which means the owner for the particular occasion, whether it be for a period of time or for a particular voyage.

(3) No technical words are necessary to create a demise of a vessel. It is sufficient if the language used in the charter-party shows an intent to transfer from the owner to the charterer the possession, command, and control of the vessel. While it may be true that a certain clause in the charter-party may indicate an intent by the owner to retain a certain amount of possession, command, and control, there may be other clauses clearly indicating a contrary intent. In reviewing a charter-party it is necessary to examine it as a whole to ascertain the true intent of the parties and to further note the manner in which the contract is carried out by the parties. If the document construed as a whole shows a transfer of possession, command, and control to the charterer, and if the manner of carrying out the contract is consistent therewith, then there is a true bareboat charter of the vessel.

(4) It may be argued that a clause in a charter-party stipulating that the owner's master and/or crew will accompany the vessel is a failure to transfer sufficient possession, command, and control so as to create a true bareboat charter. While this may be correct under certain circumstances, such a clause does not necessarily mean that there is no bareboat charter of the vessel. It is to be emphasized that it is the intent of the contract as a whole plus the conduct of the parties which is controlling. Thus, it is quite possible for there to be a bareboat charter so as to eliminate the inspection requirements even though the owner selects the master and/or crew to accompany the chartered vessel. On the other hand, the terms of a charter-party may, without qualification of any kind, show a clear intent to transfer complete possession, command, and control to the charterer, while in actuality the operation of the vessel is found to be contrary to such expressed intent. No demise charter would exist in this case.

(5) OCMI's who must examine charters to determine if they are bareboat charters are advised that the following provisions in charters have led to the conclusion that they are valid bareboat charters:

(a) A provision to the effect that, although the master and crew are furnished by the owner, full control, possession, and navigation is vested in the charterer. In connection with this point there is no harm in a provision requiring the charterer to be guided by the advice of the master in regard to technical navigating circumstances.

(b) A provision that the master and crew be paid by the charterer.

(c) A provision that all supplies, such as food, fuel, and deck and engineroom stores be provided by the charterer.

(d) A provision that all port charges and pilotage fees be paid by the charterer.

(e) An insurance provision, at least to the extent of covering liability not covered by the owner's insurance. A greater indication of full control in the charterer would of course be shown if all insurance would be carried by the charterer. However, the owner should be able to protect his interest in the vessel.

(f) A provision granting the right to discharge for cause the master or any crewmember without reference to the owner.

(g) A provision for survey upon delivery and redelivery.

(h) A provision stipulating that the vessel may only be used for pleasure purposes of the charterer, his family, and guests and the vessel shall not engage in the transportation of merchandise or carry passengers for hire or engage in any trade in violation of the laws of the United States.

(6) Any provision which tends to show retention of possession, command, and control, including navigation, in the owner should be carefully examined to see if it defeats a claimed intent to create a true bareboat charter.

(7) With regard to those circumstances where under the terms of the charter-party the owner

accompanies the vessel as master, the Coast Guard would have to study the charter closely since it is very difficult for the owner-master to give up the amount of possession, management, control, and navigation necessary to create a demise of a vessel.

(8) Basically, neither the frequency of bareboat charter transportations nor the duration of the periods of time involved under the charter-parties has any connection with the question as to whether or not a particular transaction is a demise. However, when it is known that a vessel is being chartered frequently, the nature of the transaction and the terms of the charter-party should be carefully examined in reaching a conclusion which will determine ultimately whether or not the vessel is subject to inspection.

Note: Some owners employ the bareboat charter as a means of avoiding the inspection laws. Most of them do so under the assumption that their vessels could not qualify for an inspection certificate. In some cases, this assumption is unfounded. Vessel owners should be encouraged to communicate with Coast Guard inspectors to determine whether or not their vessels are subject to the vessel inspection laws and to learn what they may do to bring their vessels within the requirements of the vessel inspection laws and Coast Guard regulations if they are found deficient in any respect.

30–10–10F. CABLE FERRIES

On 25 July 1922, the Acting Solicitor of the Department of Commerce rendered an opinion regarding a vessel operated as a double-ended ferry with two drums on board for endless cable which is fastened on shore at each side of the river, the vessel thus being pulled across the river back and forth by machinery. This type of vessel was determined to be "propelled by machinery" and could be subject to inspection both under 46 U.S.C. 404 and the Motorboat Act of 1940 as amended (46 U.S.C. 526 *et seq.*). A ferry of less than 65 feet in length, propelled by machinery utilizing a cable attached to the vessel, is a motorboat within the meaning of the Motorboat Act of 1940 and is subject to the requirements thereof. It is immaterial whether the engine which actuates the drum for winding the cable is located on the vessel or on the shore. In either case, the vessel is propelled by machinery within the meaning of the Motorboat Act of 1940.

30–10–10G. LENGTH DETERMINATION OF SMALL VESSELS

Several inquiries have been received by the Commandant as to the method of determining the length of small passenger vessels particularly when the length determines the specific regulations to be applied. It is not intended that a motor vessel be permitted to operate as a motorboat simply because its admeasurement length in CG-408, *Merchant Vessels of the United States*, shows it to be less than 65 feet. However, the determination of length, for obvious practical reasons, must be treated in two separate categories; inspected and uninspected vessels.

30–10–10G(1). Inspected Vessels. In the case of existing inspected vessels, the length as determined at the initial inspection should be accepted until such time as an alteration to the vessel would obviously necessitate remeasurement. In the case of new vessels that are being inspected for the first time, the length shall be determined in accordance with 46 CFR 175.10–19.

30–10–10G(2). Uninspected Vessels. The length as shown on the Federal or state documents should be accepted for the purpose of determining required equipment, etc., unless there is an obvious discrepancy.

▼*30–10–10H. INSPECTIONS AND TESTS OF RAILINGS*

A recent casualty aboard a certificated 46 CFR Subchapter T vessel has indicated that certain procedures on the part of Coast Guard inspection personnel may assist in preventing similar casualties. The vessel involved was a 95-foot, party-fishing boat, with sixty-three persons aboard. While fishing offshore, in a moderate sea, the vessel rolled to starboard causing all the passengers on that side of the vessel to lean or fall heavily upon the railing at the same time. The railing gave way and nine persons fell overboard. Fortunately, all were recovered, and no injuries were sustained.

An investigation revealed that the vessel had undergone inspection seven months prior to the casualty. Subsequent to that inspection, but not as a requirement of the inspection, the owner replaced the aluminum railing sockets. This was done without notification or approval of the OCMI. The sockets were not of a type acceptable for marine use, and when installed and painted were not readily discernible. The failure of the aluminum sockets was the primary cause of this casualty.

During the course of inspection of Subchapter T vessels, the inspector shall question the owner or his representative concerning any repairs which have been made or are anticipated. The requirement of the regulations that such repairs and/or alterations be made only with the knowledge and approval of the OCMI shall be explained and emphasized. Vessel railings shall be given a visual examination to identify any discernible defects or material problems. This shall be followed by an appropriate test to assess the ability of the railing to withstand the cumulative load of those persons who may be relying upon it for support.

Prior to the above casualty, moderate shaking of the railing had been regarded as acceptable in the interest of preventing the owner from having to make what might be unnecessary repairs. This casualty has pointed out, however, that railings may periodically be required to withstand the cumulative instantaneous lateral force of a large number of people and a more vigorous testing is warranted. While a destructive test is not desired, the inspector shall give railings a test of sufficient strength such that a repeat of the above casualty would not be expected.

▼*30–10–101. PUBLIC AWARENESS*

▼30–10–101(1). General. It has been found that the public, in general, is unaware of the Coast Guard's safety requirements for small, passenger-carrying vessels, and the need for a public information program is considered necessary. A pamphlet entitled *Safety for Small Passenger Vessels* (CG-491) has been developed for this purpose. It is designed to alert the general public to Coast Guard inspection and licensing requirements on small passenger vessels.

The Commandant has distributed an initial bulk supply of these pamphlets to district commanders for further distribution to marine safety and other field units in proportion to the number of small passenger vessels operating in each zone. OCMI's shall provide distribution to operators of small passenger vessels for further distribution to the public. The pamphlet is designed to permit vessel operators to stamp an individual vessel identification on the last page and promote their own vessel.

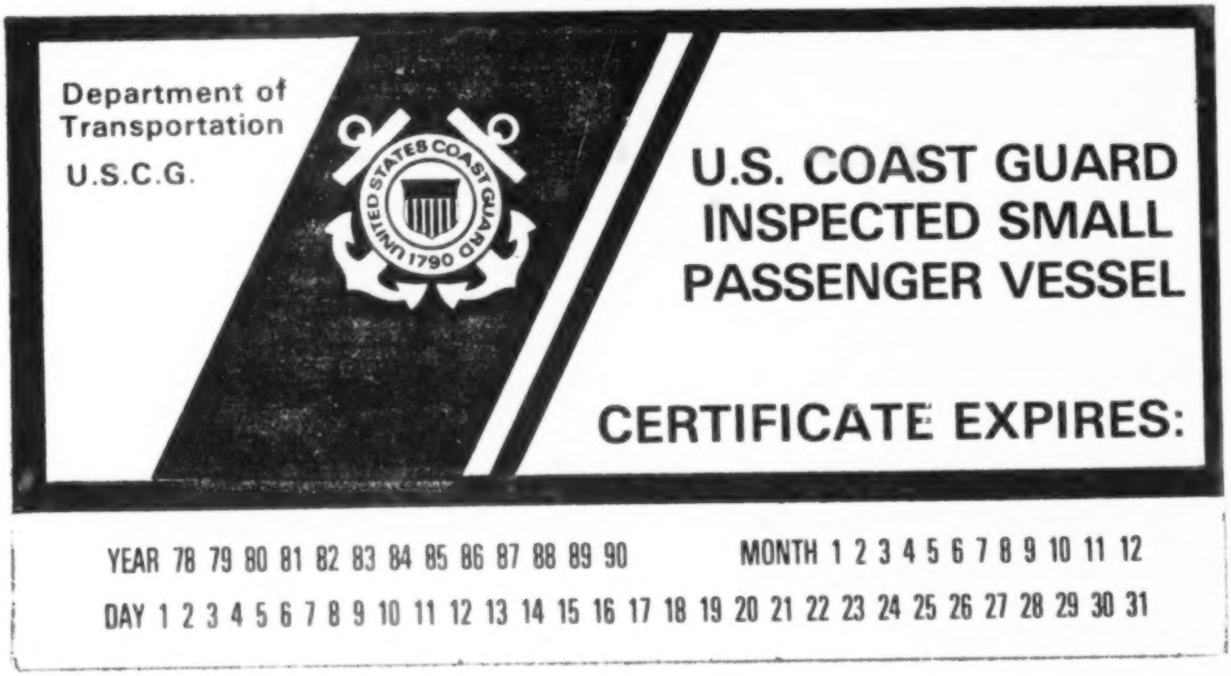
Requests for additional pamphlets shall be submitted on form CG-4428 in accordance with the ordering instructions contained in the *Directives, Publications and Reports Index* (CG-236).

▼30–10–101(2). Certification Expiration Date Stickers. A new regulation (46 CFR 176.01–45), contained in the Federal Register, Vol. 43, No. 137 — Monday, July 17, 1978, requires small passenger vessels to display Certification Expiration Date Stickers as of 15 October 1978. This requirement is intended to increase public awareness of vessel inspection requirements and to induce people to favor small passenger vessels which indicate that they meet the requirements. The sticker is described on plate 30–10–101(2).1.

Stickers shall be made available by the Coast Guard inspector after completion of an inspection for certification or at any other time when the inspector determines that additional sticker(s) or different location(s) are needed to comply with the new regulation. Expired stickers and stickers on vessels with

Plate 30-10-10I(2).1.

Certification Expiration Date Sticker for
46 CFR Subchapter T Vessels



Department of
Transportation
U.S.C.G.

U.S. COAST GUARD
INSPECTED SMALL
PASSENGER VESSEL

CERTIFICATE EXPIRES:

YEAR 78 79 80 81 82 83 84 85 86 87 88 89 90 MONTH 1 2 3 4 5 6 7 8 9 10 11 12

DAY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

NOTES:

(1) The actual sticker is Coast Guard red and Coast Guard blue on a white background in the actual size shown above.

(2) The sticker has adhesive on the back with a peel-off cover. The adhesive is not adjustable and care should be exercised in placing the sticker on vessels. After a short time in place, the sticker will probably not be removable without destroying it. Removal of old stickers may require the use of a razor-blade-type of scraping device.

(3) Stickers can be obtained from the Coast Guard Supply Center, Brooklyn, New York using stock number 7510-01-GF2-8620.

(4) Adhesive-backed materials have a finite shelf life, especially considering the need to withstand three years of exposure to a marine environment. It is recommended that supplies be stored in a controlled atmosphere (i.e., heated and air conditioned) and that excess quantities not be ordered. Annual ordering based on annual needs is appropriate.

a surrendered or revoked Certificate of Inspection must be removed.

Stickers are designed such that the expiration date of the Certificate of Inspection can be punched into the date block at the bottom using a standard, one-hole, paper punch. OCMI's should provide punches and scrapers to marine safety personnel as needed.

30–10–15. EXCURSION PERMITS

30–10–15A. GENERAL

An excursion vessel as referred to in the regulations (46 CFR 72.40–5(c) and 177.35–1(c)) is a passenger vessel that is engaged in making short cruises for special events or recreational purposes. The operation of an excursion vessel is chiefly seasonal and normally involves the carriage of deck passengers.

30–10–15B. PERMITS

When an operation is not permitted under the vessel's normal Certificate of Inspection, a Permit to Carry Excursion Party (form CG-949) may be issued under 46 CFR 71.10 or 176.01–30, as applicable. Instructions on the issuance of form CG-949 are in chapter 20 of this manual.

30–10–15C. CONDITIONS OF PERMITS

The OCMI shall be responsible for determining the additional number of passengers that may be carried, the number and kind of lifesaving appliances that shall be provided, and the limitations of route, etc., for a vessel to engage in an excursion as provided in 46 U.S.C. 453. The inspection of the vessel prior to issuing a Permit to Carry Excursion Party (form CG-949) shall be of the same scope as a reinspection of a passenger vessel and particular attention shall be directed to lifesaving and firefighting appliances.

30–10–15D. PASSENGER CAPACITY

The number of passengers normally permitted on excursion vessels shall be governed by 46 CFR 176.01–25 for small passenger vessels. For those excursion vessels inspected under 46 CFR Subchapter H (Passenger Vessels), there are no specific limitations in the regulations on the number of passengers permitted (other than stability limitations). In order to obtain some degree of uniformity in the application of the regulations, however, the criteria of one passenger for each 10 square feet of deck space shall be used as a guide by the OCMI's in determining the number of passengers permitted. In this determination, the areas occupied by concession stands, etc., as mentioned in 46 CFR 176.01–25(b)(2), shall be excluded. Passengers are to be counted on excursion vessels as often as necessary to prevent the practice of overloading.

30–10–15E. OPERATIONAL LIMITS

The number of passengers permitted and the route permitted for a vessel engaging on a temporary excursion under a Permit to Carry Excursion Party, form CG-949, shall be limited to an operation which the OCMI believes can be undertaken with safety. Careful consideration in the light of possible downflooding (interior flooding of a vessel from the decks or over the gunwale) shall be given those river- and bay-type vessels when permitting an excursion route which is different from that which appears on its Certificate of Inspection. Stability of the vessel shall always be considered in the issuance of a Permit to Carry Excursion Party.

30–10–20. CARGO VESSELS

30–10–20A. CARRIAGE OF PASSENGERS

Section 26 of the Merchant Marine Act of 1920 (46 U.S.C. 882), relating to the carriage of passengers on other than passenger vessels in full compliance with the law and regulations, provides that the owner, agent, or master of the vessel shall first notify the passengers of the presence on board of any danger-

Stickers shall be made available by the inspector after completion of an inspection for certification, or at any time the inspector determines that additional stickers or different locations are needed to comply with the new regulation. Expired stickers and stickers on vessels whose COI's are surrendered or revoked must be removed.

The stickers are designed such that the expiration date of the COI can be punched into the date block at the bottom using a standard one-hole paper punch. OCMI's shall provide punches and scrapers to marine safety personnel as needed.

30-10-15. EXCURSION PERMITS

30-10-15A. GENERAL

An "excursion vessel," as referred to in 46 CFR 2.01-45, 72.40-5 (c), and 177.35-1(c), is a passenger vessel engaged in making short cruises for special events or recreational purposes. The operation of an excursion vessel is chiefly seasonal and normally involves the carriage of deck passengers.

30-10-15B. PERMITS

When such an operation is not permitted under the vessel's normal COI, a Permit to Carry Excursion Party, Form CG-949, may be issued under 46 CFR 71.10 or 176.01-30, as applicable. This would be the case when a passenger vessel is permitted to carry additional passengers or to operate on an extended route, or when a cargo or miscellaneous vessel is permitted to carry recreation parties on a one-day basis. The permit shall be issued for a limited time, and it shall be considered only a temporary supplement to the COI; an excursion permit shall not be used to circumvent inspection requirements. Instructions on the issuance of Form CG-949 are located in subpart 48-2-40 of this manual.

30-10-15C. CONDITIONS OF PERMITS

The OCMI shall be responsible for determining the additional number of passengers that may be carried, the number and kind of lifesaving appliances that shall be provided, and the limitations of route, etc., for a vessel to engage in an excursion as provided in 46 U.S.C. 453. Inspection of the vessel prior to issuance of a Permit to Carry Excursion Party shall be of the same scope as a reinspection of a passenger vessel, and particular attention shall be directed to lifesaving and firefighting appliances. The applicable minimum stability and fire safety standards shall be maintained in all cases and shall not be waived or relaxed.

30-10-15D. PASSENGER CAPACITY

The number of passengers normally permitted on excursion vessels shall be governed by 46 CFR 176.01-25. Vessels that do not comply with structural fire protection requirements of 46 CFR 177.10-5 shall not be allowed to carry more than 150 passengers. For those excursion vessels inspected under 46 CFR, Subchapter H (Passenger Vessels), there are no specific limitations in the regulations on the number of passengers permitted (other than stability and subdivision limitations). In order to obtain some degree of uniformity in the application of the regulations, however, the criteria of one passenger for every 10 square feet of deck space shall be used as a guide by the OCMI's in determining the number of passengers permitted.

30-10-15E. OPERATIONAL LIMITS

The number of passengers and the route permitted for a vessel engaging on a temporary excursion under Form CG-949 shall be limited to an operation which the OCMI believes can be undertaken with safety. Careful consideration of possible downflooding (interior flooding of a vessel from the decks or over the gunwale) shall be given to river- and bay-type vessels in permitting an excursion route different from that which appears on the COI. Stability of the vessel shall always be considered in the issuance of a Permit to Carry Excursion Party.

30-10-20. CARGO VESSELS

30-10-20A. CARRIAGE OF PASSENGERS

Section 26 of the Merchant Marine Act of 1920, 46 U.S.C. 882 (relating to the carriage of passengers on other than passenger vessels in full compliance with the law and regulations), provides that the owner, agent, or master of the vessel shall notify the passengers of the presence on board of any dangerous articles or of any other condition or circumstance which would constitute a risk of safety for the passengers or crew prior to sailing. Accordingly, all persons other than members of the crew and military personnel carried (either under waiver or otherwise) on vessels not in full compliance with statutes and regulations applicable to passenger vessels must be given the notice as mentioned above. Failure to give such notice renders the vessel subject to a penalty of $500, which may be mitigated or remitted by the Commandant upon proper presentation of the facts or extenuating circumstances.

30-10-20B. PERSONS IN ADDITION TO THE CREW

A cargo or tank vessel shall comply with the laws and regulations relative to lifeboats, life preservers, and other lifesaving equipment before the vessel may carry persons in addition to the crew. After the vessel is found to comply with applicable laws and regulations, authority to carry up to sixteen persons in addition to the crew on domestic voyages, and up to twelve persons in addition to the crew on foreign voyages may be granted by issuing a Certificate of Inspection Amendment (Form CG-858) or by a special endorsement on the COI.

30-10-20C. CARRYING MORE THAN 16 PERSONS IN EMERGENCY SITUATIONS

P.L. 94-85, enacted on 9 August 1975, amends 46 U.S.C. 882 to allow cargo vessels to carry in excess of sixteen persons in addition to the crew in emergency situations. Certain conditions must be met before the OCMI can so amend the COI:

- The vessel must not be engaged in an international voyage;
- An emergency situation must exist;
- Additional lifesaving and firefighting equipment found necessary by the OCMI must be provided;
- A stability evaluation must have been performed; and
- Any other conditions considered necessary by the OCMI must be satisfied (see 46 CFR 91.01-25).

30-10-20D. SUBDIVISION

The 1966 Load Line Convention allows deeper drafts for those dry cargo vessels which qualify as one- or two-compartment subdivision vessels. The determination and assignment of a load line is a function delegated to ABS. Therefore, when a deeper draft is allowed due to subdivision consideration, it is necessary that inspections for certification and subsequent reinspections be conducted with the object of proper maintenance of bulkheads, closures, etc., essential to the preservation of the applicable subdivision criteria (see Chapter 76 of this manual).

30-10-20E. EQUIVALENTS FILED WITH IMCO

See section 30-9-35D of this manual.

30-10-20F. POLLUTION PREVENTION

(To be developed.)

30-10-20G. CARRIAGE OF COMBUSTIBLE LIQUIDS IN BULK ABOARD CARGO VESSELS

Vessels certificated as passenger, cargo, or miscellaneous vessels may carry limited quantities of flammable or combustible liquid cargo in bulk in accordance with 46 CFR 30.10-5, 70.05-30, and 90.05-35. However, the principal purpose or use of such vessels may not be the carriage of such cargo. "Limited quantities" shall not exceed 20 percent of the vessel's deadweight, and shall apply only to bulk liquid cargo or that cargo carried in integral or independent tanks. There is no limit to the total quantity carried in portable tanks or marine portable tanks. "Principal purpose" as used herein cannot be further defined. A subjective evaluation will have to be made on a case-by-case basis by the OCMI to determine that the vessel will not primarily engage in the carriage of liquid bulk cargo.

Cargo barges certificated under Subchapter I may not carry flammable or combustible bulk liquid cargoes in any quantity. Barges carrying such cargoes are considered tank barges and shall be certificated under Subchapter D. Subchapter I barges may, however, carry fuel for the use of their machinery and not be considered tank barges. Where it is demonstrated that there is a need for additional fuel on occasional long voyages, a Subchapter I barge may carry such fuel for its propelling vessel. This may be permitted only when the OCMI is satisfied there is a genuine need for the fuel and that the applicable admeasurement or safety regulations are not being circumvented. This concept should be applied only for occasional long voyages; if the additional fuel is needed on a regular route, a propelling vessel with its own sufficient fuel capacity should be employed.

The cargo oil discharge containment requirements of 33 CFR 155.310 shall be applied to Subchapter I vessels where 250 barrels or more of bulk cargo oil are carried. However, the pollution requirements of 33 CFR 157 are not applicable to vessels certificated solely under Subchapter I.

30-10-25. TANK VESSELS

30-10-25A. PERMANENTLY MOORED TANK VESSELS

A tank vessel that is permanently moored at a fixed location to dispense, receive, or store flammable or combustible liquids in bulk may, at the request of the owner, be considered "substantially a land structure" and subjected to the waterfront facility regulations (33 CFR 126, 154, and 156). To qualify

30-10-30C(2). Plan Approval. Complete plan approval is required for all vessels contracted for on and after 1 January 1964, and all applicable plans shall be submitted as required by 46 CFR Parts 90-105 (Subchapter I-Cargo and Miscellaneous Vessels).

30-10-30C(3). Inspections. The basic regulations for inspecting these vessels are in 46 CFR Subchapter I. It is the Commandant's policy, that in applying the regulations, the OCMI shall liberally construe the intent expressed therein while bearing in mind the overall responsibility to insure that the vessel can be navigated with safety. Any unusual condition or feature of the vessel which is found to be acceptable by the OCMI at the initial or subsequent inspections shall be made a matter of record so that once having been accepted it will not be rejected at a later date.

30-10-30C(4). Load Lines. See part 76-1 for load line requirements. If a load line assignment is not required, draft limitations may be imposed as a prerequisite to obtaining a Certificate of Inspection if, in the opinion of the OCMI, limitations are necessary for the safety of life and property.

30-10-30C(5). Lifesaving Equipment. When the barges are operated as manned barges, whether required or permitted, the requirements of 46 CFR Part 94 (Lifesaving Equipment) apply. The regulations permitting substitution of inflatable liferafts may be utilized. However, barges that do not go more than 20 miles to sea from a harbor of refuge, and which return to that same harbor, may be equipped with lifefloats or buoyant apparatus in lieu of lifeboats or inflatable liferafts.

30-10-30C(6). Manning.

(a) Required Manning. Certain barges may be unmanned if so authorized by the OCMI. However, if a crew is required by the OCMI, the following manning is applicable:

(i) 75% of the crew must be citizens of the United States,

(ii) 65% of the deck department, exclusive of licensed personnel, must be *Able Seamen* as defined in 46 U.S.C. 672b-1,

(iii) All crewmembers must possess a Merchant Mariner's Document validation for emergency service, and

(iv) The watch system applies.

(b) Permitted Manning. When the OCMI does not deem it necessary to require a crew on subject barges, a crew may still be permitted and in such cases the following is applicable:

(i) Barges may carry a person or persons as maintenance men with no duties connected with the navigation of the vessel. A sample endorsement that may be used on the Certificate of Inspection is:

> Certificated without a navigating crew. The vessel may carry one person as maintenance man and operator of the dumping mechanism, with no duties connected with the navigation of the vessel.

(ii) 75% of the personnel of this "permitted" crew must be U.S. citizens, and

(iii) All crewmembers must be in possession of a Merchant Mariner's Document validated for emergency service.

30-10-30D. NON-SELF-PROPELLED HARBOR DREDGES, BARGES, ETC., WHICH CHANGE PLACES OF EMPLOYMENT

30-10-30D(1). General. Non-self-propelled harbor dredges, barges, etc., of 100 gross tons or over, making voyages on the high seas when changing places of employment, are subject to inspection and certification when operating on the high seas. 46 CFR 91.01-10(c) provides for a limited or short-term certificate for such voyages. The intent of these regulations is to permit such voyages with barges either manned or unmanned. In those cases where barges are manned, the intent is to require a more thorough inspection than if they were operated unmanned.

30-10-30D(2). Plan Approval. Plan approval is not a prerequisite to the certification of subject vessels.

30-10-30D(3). Inspections. The basic regulations for inspection of subject vessels are in 46 CFR Parts 90-105—Subchapter I. It is the Commandant's policy that in applying the regulations, the OCMI shall liberally construe the intent expressed therein while bearing in mind the overall responsibility to assure that the vessel can be navigated with safety.

30-10-30D(4). Load Lines. See part 76-1 for load line requirements. In the case of subject vessels which are making a voyage on the high seas and are not required to have a load line, the OCMI shall insure himself that there are adequate closures to maintain watertight integrity for the duration of the voyage. Draft limitations may be imposed as a prerequisite to obtaining a Certificate of Inspection, if, in the opinion of the OCMI such draft limitations are necessary in the interest of safety of life and property. Non-self-propelled dredges may be permitted to carry spare parts for their own machinery without having such spare parts considered as cargo, if, in the opinion of the OCMI having jurisdiction, the quantity and weight of these spare parts are reasonable.

30-10-30D(5). Lifesaving Equipment. When vessels are operated as manned barges, whether required or permitted, the requirements of 46 CFR Part 94 (Lifesaving Equipment) apply. The regulations permitting substitution of inflatable liferafts may be utilized.

30-10-30D(6). Boilers. In some cases subject vessels will be equipped with boilers. In those cases where the boilers will be used during the voyage, the boilers shall be given such operating tests and examinations as the OCMI deems necessary to insure proper functioning throughout the voyage. On the other hand, when these boilers will not be utilized during any part of the voyage on the high seas for change of place of employment, the boiler will not be subject to inspection. In either case, any unsafe or unsatisfactory conditions observed during the course of inspection shall be made a matter of record and the owner of the vessel so advised in writing by the OCMI.

30-10-30D(7). Wiring. Only the electric wiring that will be energized during any part of a voyage on the high seas for change of place of employment shall be subject to inspection. Any unsafe or unsatisfactory condition observed during the course of inspection shall be made a matter of record and the owner of the vessel so advised in writing by the OCMI.

30-10-30D(8). Drydocking.

(a) Foreign Voyage. An examination in drydock of the underwater body and outboard fittings of subject vessels shall be a prerequisite to the issuance of a Certificate of Inspection, unless there is a record of a satisfactory drydock examination within the preceding 18 months.

(b) Domestic Voyage. The OCMI shall normally require a drydocking unless there is acceptable evidence presented of a drydocking and satisfactory condition reported within the past 3 years.

30-10-30D(9). Manning.

(a) Required Manning. Subject vessels may be towed unmanned if so authorized by the OCMI. However, if a crew is required by the OCMI, the following is applicable:

(i) 75% of the crew must be citizens of the United States,

(ii) 65% of the deck department, exclusive of licensed personnel, must be Able Seamen,

(iii) All crewmembers must possess a Merchant Mariner's Document validation for emergency service, and

(iv) The watch system applies (on voyages up to 600 miles only a 2-watch system is necessary).

valve or flame arrester at or near the outlet. The Commandant has accepted this arrangement. The requirement for a flame arrester or a pressure-vacuum relief valve in the header is in addition to the pressure-vacuum relief valve in the individual branch vent line. On the other hand, pressure-vacuum relief valves in the branch vent lines are not mandatory (see 46 CFR 32.55-20(b)(3)).

30-10-25G. CARRIAGE OF PASSENGERS

(See sections 30-10-20A and B.)

30-10-25H. PRESSURE VESSEL TYPE CARGO TANKS

Review of Headquarters records of tank barges certificated to carry liquefied gas in pressure vessel-type cargo tanks indicate that the tanks on several such barges over 20 years old have never been hydrostatically tested. In accordance with 46 CFR 38.25-1(b), a hydrostatic test of such tanks may be conducted at any time that an inspector considers such a test necessary to determine the condition of a tank. When a tank barge which is 20 or more years old becomes due for an internal exam, the cargo tanks should be very carefully examined and the desirability of a hydrostatic test especially considered.

30-10-30. SEAGOING BARGES

30-10-30A. REQUIRED INSPECTIONS

Sections 10, 11, and 12 of the Act of May 28, 1908, as amended (46 U.S.C. 395-397), require inspections of the hull and equipment of every seagoing barge of 100 G.T. or more (seagoing barges are defined in 46 U.S.C. 395(d)).

Scows and other similar types of vessels are seagoing barges within the meaning of 46 U.S.C. 395 and therefore require a COI when operating on the high seas. When a COI is issued to a seagoing barge, the barge is subject to the inspection requirements until the COI is surrendered or expires, even though the barge may be operated for part of the time in inland water areas (see part 76-1 (Volume V) of this manual for load line requirements).

An amendment to 46 CFR 7 (Boundary Lines) will be made to specifically refer to 46 U.S.C. 395. Until such time, seagoing barges will be inspected when, in the judgement of the OCMI having jurisdiction, the routes assigned to such barges carry them into waters which are essentially offshore and adversely expose them to the effects of the open seas. Such barges will be inspected in all cases when the routes assigned go beyond 12 nautical miles seaward of the base line from which the territorial sea is measured.

30-10-30B. SEAGOING WOODEN BARGES

Particular attention should be given to the inspection of seagoing wooden vessels of considerable age. If the vessel is not on drydock at the time of inspection, a thorough examination of the entire structure shall be made, insofar as possible. In this connection, the ceiling may be lifted for examination of the framing at such places as the marine inspector may deem necessary. Should doubt as to the soundness of the structure remain, the vessel should be placed in drydock for further examination. The following checklist is offered for guidance at drydock examinations of wooden vessels:

(1) The keel, stem, stern frame and sternposts, decks, hatch coamings, and the means of closing hatches should be examined;

(2) The outside planking should be clean so that a thorough examination can be made, and the entire outside planking shall be examined and caulked where necessary;

(3) Careful examination should be made of all fastenings, especially in the centerline members. Where there is evidence of fastenings having been strained, new fastenings should be driven through and clinched;

(4) Beams, beam ends, beam end connections, and knees should be examined and bored to determine their condition. If the condition of the beam end connections is uncertain, sufficient deck planking should be removed in the way of beam ends for inspection;

(5) Borings should be made to determine the condition of the planking and framing, and should such boring cause doubt as to the condition of the framing, a number of outside planks above and below the bilge strakes should be removed for a thorough examination of the frame timbers;

(6) Limbers should be clear;

(7) Special attention should be paid to the condition and efficiency of bilge pumping arrangements.

production facilities yet avoid inspection and certification as a tank vessel. A proviso in the Act exempts "... vessels of not more than five hundred gross tons documented in the service of oil exploitation which are not tank vessels and which would be subject to 46 U.S.C. 391a only because of the transfer of fuel from the vessels' own fuel supply tanks to offshore drilling or production facilities." This proviso was intended primarily for uninspected vessels since vessels which are inspected and certificated under 46 CFR Parts 90–109 (Subchapter I) are permitted by 46 CFR 90.05–35 to carry limited quantities of certain grades of flammable and combustible cargoes which do not have to be the same as the vessel's fuel.

Another statute which allows vessels to dispense their fuel is 46 U.S.C. 467. This statute is much more restrictive in that the fuel must have a flash point of not less than 150°F, must be carried in double bottom fuel tanks, must be the vessel's *excess* fuel, and cannot be discharged with passengers on board.

30–10–45. RESEARCH VESSELS

▼*30–10–45A. OCEANOGRAPHIC RESEARCH VESSELS*

30–10–45A(1). General. Oceanographic research vessels shall be given an inspection for certification with such reinspections as are deemed necessary by the Commandant in accordance with the provisions of 46 CFR Parts 188–196 (Subchapter U – Oceanographic Vessels). Classification as an oceanographic research vessel requires a finding as such by the Coast Guard. In arriving at a definite finding, an analysis of the particulars of service, method of operation, and classes and number of persons carried should be conducted. For those uninspected vessels which allege to be less than 300 gross tons, admeasurement may be included in the analysis.

30–10–45A(2). Accommodations. Accommodations for officers, crew, and scientific personnel shall comply with 46 CFR 190.20 except that the requirements of 46 CFR 190.20–20(a) may be modified to the extent that deck and engine groups of the crew on watch at the same time may be quartered together. In addition, special consideration shall be given to accommodations for students carried on voyages of 14 days or less, provided the general intent expressed in 46 CFR 190.20–5 is carried out. Accommodations for persons in addition to the crew should also be in compliance with this general intent. A space normally used as a hospital space under the requirements of 46 CFR 190.20–35(a) may be used for ordinary berthing on voyages of three days or less.

▼***30–10–45A(3). Scientific Personnel.*** Scientific personnel are not classified as either "seamen" or as "members of the crew" but are properly classified as other persons engaged on board a vessel for the purpose of conducting the business of the vessel. The carriage of these scientific personnel shall be indicated by separate endorsement on the Certificate of Inspection and also shall be reflected in the "total persons allowed."

Research vessels less than 100 GT which carry other than college and university students (i.e., high school, grammar school, youth clubs, etc.) are not considered to be carrying those persons as "scientific personnel;" however, they may be considered personnel "under instruction" in liminology or oceanography depending upon the course offered. Any questionable cases shall be referred to Commandant (G-MVI) for resolution.

30–10–45A(4). Public Vessels. Research vessels operated as public vessels are not required to be inspected and certificated by the Coast Guard. However, these public vessels may be inspected and certificated if so requested by the Department of Defense. When public vessels are only furnished a letter indicating a degree of compliance with the regulations, every effort should be made to obtain one-compartment subdivision and damage stability calculations when only 100% lifeboatage is provided.

▼30–10–50. IMMOBILE VESSELS SUCH AS SHOWBOATS, HOTELS, AND MUSEUMS

▼*30–10–50A. GENERAL*

A showboat, theater, hotel, restaurant, museum vessel, etc., is not a vessel within the meaning of 1 U.S.C. 3 if it is taken out of navigation. In these circumstances, the vessel is to to be regarded as "substantially a land structure" and not subject to the inspection laws. To qualify as "substantially a land structure," the vessel must be securely and substantially moored as approved by the OCMI. The mooring must be rigged so that the lines cannot be inadvertantly or accidently cast off, the vessel is unlikely to break her mooring, and the vessel cannot be moved from the dock, pier, etc., without special effort, such as the use of tools, being directed to such action.

A vessel may be placed in navigation periodically and still retain its status as "substantially a land structure" when moored. When placed in navigation, it again becomes subject to the regulations applicable to the vessel's particular operation. The owner or operator must notify the cognizant OCMI prior to placing the vessel in navigation. When the vessel is again immobilized, the cognizant OCMI must approve the mooring arrangement before the vessel can be classed as "substantially a land structure." Once these conditions are met, the vessel would again be considered out of navigation and no longer subject to Coast Guard regulations.

However, if the owner chooses to have his immobile structure documented as a vessel of the United States, logically it can no longer be considered as "substantially a land structure." In addition, if the structure is to be used in a manner normally requiring inspection, the structure must be inspected and certificated prior to being documented as a vessel of the United States.

The appropriate local authorities should be advised whenever a vessel's status is changed to "substantially a land structure" so that appropriate local safety codes may be applied.

▼*30–10–50B. GROUNDED TANK VESSELS*

Questions have been raised as to whether a vessel which is used for the storage of soya bean oil (a Grade E liquid) would be subject to inspection under 46 U.S.C. 391a if she were grounded at a suitable location and not afloat. Information has also been requested concerning the status of such a vessel if it were used for floating storage alongside a dock.

If such a vessel were completely grounded and not afloat, she would not be subject to inspection under 46 U.S.C. 391a. In order to be considered *completely* grounded, provision would have to be made to insure that the vessel would remain grounded and fixed at all times, including times of unusually high water. In other words, to be held not subject to inspection, the vessel must be so securely attached to the ground that it is not capable of being used in navigation and qualifies as "substantially a land structure."

If a vessel is to be used for floating storage alongside a dock, it would be subject to inspection under 46 U.S.C. 391a and would have to comply with those requirements of 46 CFR Parts 30–40 (Subchapter D – Tank Vessels) applicable to a vessel permitted to handle Grade E liquid cargo. (See 30–10–25A.)

▼*30–10–50C. PERMANENTLY ANCHORED VESSELS*

A permanently anchored vessel, unless excepted from inspection as described in 30–10–50A, with public patronage onboard, is a passenger vessel engaged in navigation and is subject to the marine safety statutes, regulations and requirements, including annual inspection and certification. Accordingly, the vessel, whether self-propelled or not and whether underway or permanently anchored, while operated as a public restaurant or hotel, would be subject to all of the marine safety statutes and regulations thereunder applicable to self-propelled passenger vessels.

▼30-10-50D. *DANGEROUS CARGO ACT APPLICATIONS*

Even if it is not subject to inspection and certification, the vessel, if operated as a public restaurant or hotel, would be subject to the Dangerous Cargo Act and the regulations thereunder applicable to passenger vessels relating to the carriage, stowage or use of explosive, dangerous, or hazardous articles including ships' stores and supplies of a dangerous nature.

▼30-10-50E. *FOREIGN VESSELS*

Prior to the Coast Guard making any determinations pertaining to foreign-built vessels to be used in an immobile status, a determination regarding coastwise trade should be requested from the U.S. customs Service by the vessel's owner.

▼30-10-55. BOY SCOUT VESSELS

▼30-10-55A. *GENERAL*

A formal inspection, certification, and manning agreement between the Boy Scouts of America (BSA) and the Coast Guard was signed on 1 February 1972. The Commandant's policy concerning BSA vessels which was contained in the agreement is as follows:

(1) *Inspection.* The Coast Guard, upon proper application, will inspect BSA Sea Explorer vessels and issue a Certificate of Inspection to such vessels when they are found to comply with the applicable vessel inspection regulations.

(2) *Applicable Regulations.* The rules and regulations in 46 CFR Parts 24–26 (Subchapter C – Uninspected Vessels) are applicable to those vessels not requiring certification by law or by this agreement. The rules and regulations in 46 CFR Parts 175–187 (Subchapter T – Small Passenger Vessels (Under 100 GT)) are applicable to those vessels required to be certificated by law and by this agreement.

(3) *Manning.* Certificated BSA Sea Explorer vessels will not be operated without the minimum manning as specified on the Certificate of Inspection. Sailing vessels and powered vessels will be permitted to carry a reasonable number of Sea Explorers as crewmembers who are not classified as passengers. The number in the crew will be determined at the time of inspection by the OCMI and will be indicated on the Certificate of Inspection.

(4) *Pulling Boats.* Sea Explorers engaged in the rowing of pulling boats are not considered passengers; therefore, pulling boats are not required to be inspected for certification: Provided, that they do not carry more than six passengers as defined in 46 U.S.C. 390a. These vessels must be in compliance with the appropriate regulations of 46 CFR Subchapter C.

(5) *Other Uninspected Vessels.* All powered Sea Explorer vessels 65 feet in length and under, and all Sea Explorer sailing vessels under 700 gross tons, which carry six or less passengers, are not required to be inspected for certification. Nevertheless, in the interest of safety, it is expected that such vessels will make proper application for inspection and certification.

(6) *Inspections and Certifications Required by Law.* All Sea Explorer vessels 65 feet in length and under which carry more than six passengers, as defined in 46 U.S.C. 390a, are required by law to be inspected and certificated under the provisions of 46 CFR Subchapter T.

(7) *Inspections and Certifications by Agreement.* It is recognized that a strict interpretation of the law does not require inspection and certification of vessels over 65 feet in length used exclusively for Sea Explorer training. However, to ensure that there will be maximum safety of these vessels, the Boy Scouts of America will require all Sea Explorer vessels over 65 feet in length and under 100 gross tons to meet

the requirements of Subchatper T when carrying more than six persons in addition to the crew: Provided, that certain named vessels, which were in operation by Sea Exploring prior to this agreement and due to their inability to meet the provisions of certain requirements for certification, may continue to operate; Provided further, that these vessels are issued an inspection report by an OCMI mutually agreed upon by the Coast Guard and the BSA council involved, setting forth the conditions under which these vessels may operate. The National Director of Sea Exploring, BSA, will be furnished a copy of all letters of inspection.

(8) *Acceptable Vessels for Sea Explorer Use.* It shall be the general policy of the Boy Scouts of America not to accept or approve acceptance of any vessel of 100 gross tons or over for Sea Exploring operation. In the event that any vessel over 100 gross tons is considered for acceptance, Commandant (G-MVI) shall be consulted and:

(a) The vessel will be inspected under the rules and regulations in 46 CFR Subchapter T as a "L" vessel. When the provisions of Subchapter T are unsuitable, the provisions of 46 CFR Subchapter F – Marine Engineering; 46 CFR Subchapter H – Passenger Vessels; and 46 CFR Subchapter J – Electrical Engineering shall be used.

(b) The OCMI certificating the vessel will determine the final manning requirements. The OCMI may tailor a licensed examination covering the minimum professional requirements only and restrict the license to the subject vessel.

(9) *Determination of Seaworthy Condition of Vessels to be Accepted.* When vessel donations are requested or offered for Sea Explorer use by the Coast Guard or other sources, it is agreed that a Coast Guard inspector from the nearest OCMI's office will accompany the professional marine surveyor, or other person assigned by the National Sea Exploring Committee or the council involved, as mutually agreed upon, to examine the vessel, to outline in broad generalities the vessel's feasibility of certification, and to indicate the more obvious specific requirements for certification.

(10) *Establishment of Policy and Agreements.* The administration of this agreement on behalf of Sea Exploring shall be through its National Director. All matters between the Coast Guard and Sea Exploring, BSA, shall be the responsibility of the National Sea Exploring Committee or its designee, and no matters shall be negotiated with Commandant (G-MVI) at Coast Guard Headquarters in respect to Sea Explorer matters by regional or council committees.

(11) *Amendment Provisions.* This inspection and certification agreement may be amended upon thirty days' written request by either agreeing party.

▼30-10-55B. BOY SCOUT VESSELS SUBJECT TO SOLAS 60.

All mechanically propelled Boy Scout vessels which carry more than 12 passengers on an international voyage are subject to the requirements of the SOLAS 60 Convention. Before these vessels can be issued a Passenger Ship Safety Certificate, they shall be required to obtain a Certificate of Inspection under the appropriate vessel inspection regulations. Thus, Boy Scout motor vessels of more than 65 feet in length which are not normally required to be inspected must be inspected and certificated prior to making an international voyage which makes them subject to SOLAS 60.

The Convention does provide for special exemptions from full compliance with the Convention for vessels not normally engaged in international voyages or for vessels which, in the course of their voyages, do not proceed more than 20 miles from the nearest land. Once a vessel has obtained a Certificate of Inspection, a Safety Certificate should be requested whenever the vessel intends to make international voyages. An Exemption Certificate should also be requested should a vessel's equipment not be in compliance with the Convention. An application shall be processed in the same manner as for any passenger vessel.

▼30-10-55C. *CARRIAGE OF NON-MEMBERS ON BOY SCOUT VESSELS*

Vessels which are operated under Exemption Certificates or which are given special consideration with respect to the inspection laws because of their status as Boy Scout training vessels should be restricted to the training of Boy Scouts and should not be used to carry non-members. These restrictions apply only to those vessels which are certificated to operate solely as Sea Explorer Service vessels. In the event that an individual S.E.S. vessel possesses a Certificate of Inspection which contains no restriction as to the type of passengers carried, this vessel can then carry non-members and/or other passengers within the total passenger carriage authorized by the Certificate of Inspection, provided that the licensed operator of the vessel holds a license which is not limited to "Sea Explorer Service."

The Sea Scout program depends heavily upon the support of parents and other sponsors, and it is essential to permit them to make occasional short excursions on Sea Scout vessels to maintain their support and interest. The Commandant has no objection to the issuance of Excursion Permits for the occasional carriage of persons who are not members of the Boy Scouts of America if the permits are limited to persons closely associated with Sea Explorer Service activities. This would include persons such as active sponsors, members of an S.E.S. family, and members of the Girl Scouts of America or Mariners. Additionally, there is no objection to amending the Certificate of Inspection to permit carriage of a limited number of persons who are not members of the Boy Scouts but who are engaged in S.E.S. activities. This would permit a limited number of parents or sponsors to make occasional trips without the need for special permits.

▼30-10-55D. *RADIO INSTALLATIONS*

The requirements for radio equipment are established by the Federal Communications Commission. Therefore, OCMI's should not require radio equipment in excess of that specified by the FCC. The Commandant has recommended, however, that the National Council of the Boy Scouts of America encourage all Sea Explorer Service councils to equip their vessels with a radiotelephone installation when practicable. OCMI's should make similar recommendations to local councils provided it is made quite clear that failure to comply with such recommendations will in no way adversely affect a vessel's inspection status and that installation of a radiotelephone is compulsory only when required by the FCC.

▼30-10-55E. *LICENSING REQUIREMENTS*

The licensing requirements for Boy Scout vessel operators are covered in subpart 50-11-50 of this manual.

30-10-60. CABLE SHIPS

A cable-laying ship is subject to the regulations in 46 CFR Subchapter I – Cargo and Miscellaneous Vessels. Since SOLAS 1960 makes no reference to cable ships or to other similar types in Regulation 3 with respect to exceptions, such vessels when documented come within the Convention even though it is difficult to accurately categorize them as either passenger vessels or cargo ships. The Commandant's position in this matter will necessarily be that of requiring the minimum arrangements which, having regard for the nature of the vessel's service and for inherent safety elements in the vessel's design and construction, can be considered equivalent to the requirements of the SOLAS Convention. In order to clarify the United States' position in this regard, suitable notice of equivalency must be given as provided by Regulation 5, chapter I, of the SOLAS Convention.

30-10-65. ELEVATOR VESSELS

The term "elevator vessel" as used in 46 U.S.C. 170, as amended, and in 46 CFR 146.02-2(f)(5), means a harbor service vessel that is used to load and discharge cargo vessels of bulk cargo such as grain and ores by means of elevator buckets. This type of vessel is classed in the same category as cable vessels, dredges, fireboats, icebreakers, pile drivers, pilot boats, and welding vessels (none of which carries freight as cargo for hire).

30-10-70. RECREATIONAL BOATS RENTED BY LAUNCH LIVERIES

Launch liveries have rented motorboats, including those propelled by outboard motors, to persons not familiar with safety measures required by the Motorboat Act of 1940 and the regulations promulgated thereunder. In some cases when a deposit for the safe return of lifesaving and other equipment required has been demanded, the renter of the boat has objected, and in certain instances the motorboats have been operated without the safety equipment required so that persons on board these vessels were without protection in case of emergency.

Section 16 of the Motorboat Act of 1940 (46 U.S.C. 526o) places responsibility on the owners of motorboats to see that the proper safety equipment is onboard. Boats, including those propelled by outboard motors, must be equipped with proper life preservers or lifesaving devices. These safety devices together with fire extinguishers, lights, and other equipment are required by the Motorboat Act and the regulations promulgated thereunder.

Boats rented by launch liveries for pleasure purposes shall carry the lifesaving and fire protection equipment required by law and regulation. Failure to have required equipment shall be investigated and appropriate action shall be instituted against the owner, as well as the actual operator, of the motorboat.

30-10-75. APPROVAL PROCEDURES FOR SPECIAL TYPE CRAFT

30-10-75A. UNUSUAL DESIGNS.

The Coast Guard is sometimes requested to certificate various vessels of unusual design, such as floating drilling rigs, catamarans, hydrofoil vessels, surface effect ships, etc., and vessels of seemingly traditional type, such as sailing vessels and sailing auxiliaries which incorporate features requiring detailed evaluation. Experience in the operation of such craft is often very limited or may be totally lacking. Current regulations are based upon conventional craft and they may be unreasonable or quite inadequate to insure an acceptable degree of safety for vessels of unique or unusual designs. To a lesser degree, current engineering data may also have limited applicability. For these reasons, it is considered that such craft should only be certificated after evaluation by personnel of the cognizant district (mmt) unit or by Commandant (G-MMT). The guiding principle in such evaluations shall be that the overall degree of safety should not be less than the minimum attained by application of current regulations to conventional craft.

30-10-75B. EVALUATIONS AND APPROVALS

Whenever a request is received for certification of a craft of the above-named types or of any other unusual type, pertinent plans, specifications, and design calculations should be obtained and forwarded to the cognizant district (mmt) unit for evaluation and approval. Any submittal which is considered by the district (mmt) unit to be beyond its capabilities or knowledge or which requires important policy decisions shall be forwarded with that unit's recommendations to Commandant (G-MMT) for evaluation and approval.

30-10-80. INTEGRATED TUG-BARGES

(To be developed.)

30-10-85. HYDROFOILS AND AIR CUSHION VEHICLES

(To be developed.)

▼30-10-90. OIL-RECOVERY VESSELS

▼*30-10-90A. GENERAL*

Since the first oil-recovery vessels were built, Coast Guard plan review and inspection efforts have been guided by a wide variety of criteria, each primarily dependent upon the individual situation. This subpart sets forth a consolidated and consistent approach to plan review and inspection of oil-recovery vessels.

At present, the Coast Guard's statutory responsibility with regard to oil-recovery equipment extends only to those oil-recovery vessels with an on board storage capacity of more than 110 U.S. gallons. 46 U.S.C. 391a, the Tank Vessel Act (TVA), requires that these vessels be certificated by the Coast Guard. Vessels carrying not more than 110 gallons of oil on board and "equipment" operated from vessels not requiring inspection cannot be regulated under the authority of the TVA.

Although 46 CFR Subchapter D was promulgated as a result of the TVA, it was not drafted considering possible application to oil-recovery vessels. Its present use produces unnecessary hardships on builders resulting in a product so costly that the market is generally limited to Government agencies. Equipment which will improve response to oil pollution incidents should be encouraged, and, pending development of applicable regulations, an alternate approach to the regulation of oil-recovery vessels is needed. It appears that self-propelled oil-recovery vessels as large as 300 gross tons should possibly be subject to criteria less stringent than existing inspection requirements. However, until such time as further study is completed, existing requirements of 46 CFR Subchapter D and other appropriate subchapters shall be held applicable to oil-recovery vessels of 100 gross tons or greater as a general rule.

The remainder of this subpart addresses oil-recovery vessels *under* 100 gross tons. 46 CFR Subchapter D shall be applied as it pertains to the mechanics of issuance and maintenance of the Certificate of Inspection only; the actual inspection requirements shall be given separate treatment as noted below.

▼*30-10-90B. PLAN APPROVALS*

The requirements contained in 46 CFR Subchapter C (Uninspected Vessels) and any other requirements which are normally applicable to uninspected vessels, including a requirement that the design and construction must be in accordance with good marine practice, shall be used as minimum standards for plan approval. Technical plan review is not envisioned, but some drawings may be required by the OCMI in the course of inspection.

▼*30-10-90C. INSPECTIONS*

The following minimum standards for "ignition protection" shall apply:

(1) Electrical equipment installations should be kept to a minimum. Hydraulically powered equipment should be used when available (e.g., hydraulically powered cargo pumps).

(2) Where electrical equipment is employed (switches, lights, solenoid valves, etc.), it must possess one of the following ratings:

(a) Spark ignition proof (UL 1500),
(b) Explosion proof (various), or
(c) Intrinsically safe (UL 913).

Note: The UL listing "spark ignition proof" (UL 1500) employs a standard which is based on part of the "explosion proof" test. Those electrical devices which do not create sparks in normal operation (lights, solenoids, etc.) would be inherently "spark ignition proof" and can (and should) obtain UL listing.

(3) Enclosed machinery spaces must be ventilated at a rate of at least 20 changes of air per hour by fans either designated as "nonsparking" under the provisions of 46 CFR 110.15–175(1) or meeting paragraph (2) above.

(4) Belt drives must use conducting belts, pulleys, and shafts to prevent the buildup of static electrical charges.

(5) Machinery exhausts must be fitted with spark arrestors.

(6) All exposed surfaces (machinery, light lenses, etc.) must be maintained at a temperature below 400°F. When these surfaces are normally accessible to personnel they must be maintained below 150°F for personnel protection.

(7) Oil tank vents must be fitted with flame screens and must have a cross-sectional area at least as large as the fill lines.

▼*30–10–90D. CERTIFICATES OF INSPECTION*

As a practical measure, the Certificate of Inspection (COI) can be endorsed for grades D & E combustible liquids. Requests for other cargo endorsements should be referred to Commandant (G-MVI). This limitation has been selected in recognition of the fact that the standards of safety prescribed herein may not be adequate for spills of higher grades. Conversely, the operational safety record of oil-recovery vessels and other oil-recovery equipment has been good in handling spills of grades D & E and it is recognized that hazards associated may not be sufficient to warrant even these minimal standards. A Headquarters study is being initiated to determine whether there is a limiting grade of cargo below which ignition protection is unnecessary. Particular attention will be given to the weathering process of oil on water and its effect upon the ignition potential of the light ends of crude oils. The additional hazards associated with the recovery of spilled chemicals *are not addressed in this subpart*, and requests for endorsement of the COI for such products shall be referred to Commandant (G-MVI).

The COI should indicate that the vessel is an oil-recovery vessel, and the route should be as broad as possible to accommodate transportability, yet not be so broad as to permit *operation* in areas where the vessel may not be seaworthy. Oil-recovery vessels, in response to oil pollution incidents, may be expected to be placed into operation at great distances from home ports. The need for these vessels can be expected, at times, for oil-recovery operations upon open oceans. These vessels, when engaged in oil-recovery operations, are normally in close proximity of other vessels. In these instances, a restricted route would be neither desirable nor necessary. See Plate 30–10–90D.1 for a sample Certificate of Inspection for an oil-recovery vessel.

Multi-purpose vessels employed in the recovery of spilled oil are not exempted from meeting the applicable requirements for their alternate service. For example, a skimmer used to transport another vessel's oil slops would be subject to 46 CFR Subchapter D regulations as a tank vessel.

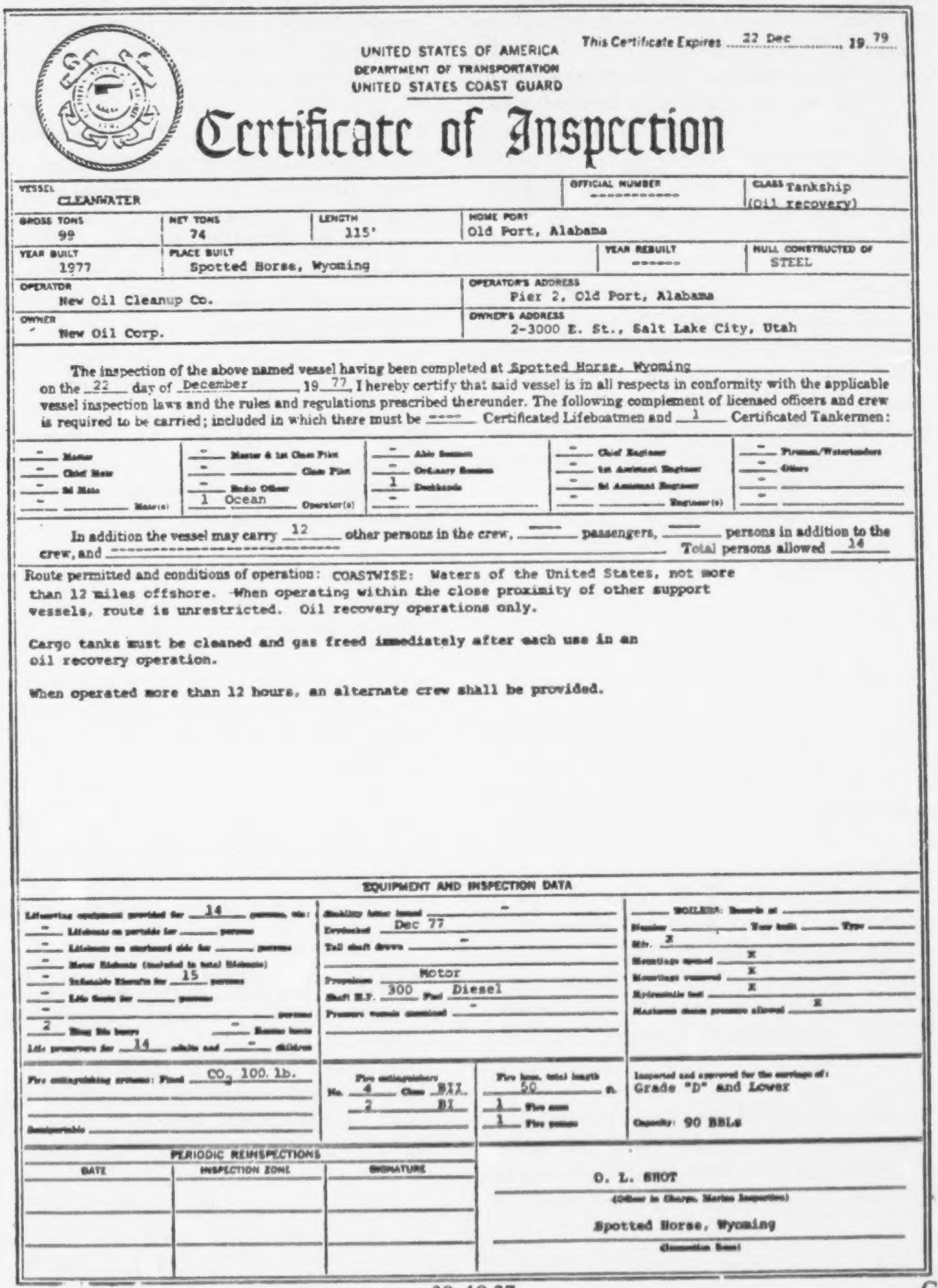
30–10–95. LANDING CRAFT TYPE VESSELS

30–10–95A. GENERAL

Landing craft vessels of the type developed for use by the armed services during war are for special purposes. These vessels are of lighter construction than normal merchant ships, and the opening type bow door presents watertight integrity problems not found on conventional vessels. The Coast Guard attempts to discourage the use of these vessels for commercial service whenever possible.

When vessels of the landing craft type have been permitted to be used, special consideration has been

PLATE 30-10-90D.1
SAMPLE CERTIFICATE OF INSPECTION FOR OIL-RECOVERY VESSEL



This Certificate Expires 22 Dec 19 79

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Certificate of Inspection

VESSEL CLEANWATER				OFFICIAL NUMBER ----------	CLASS Tankship (Oil recovery)
GROSS TONS 99	NET TONS 74	LENGTH 115'	HOME PORT Old Port, Alabama		
YEAR BUILT 1977	PLACE BUILT Spotted Horse, Wyoming			YEAR REBUILT ------	HULL CONSTRUCTED OF STEEL
OPERATOR New Oil Cleanup Co.			OPERATOR'S ADDRESS Pier 2, Old Port, Alabama		
OWNER New Oil Corp.			OWNER'S ADDRESS 2-3000 E. St., Salt Lake City, Utah		

The inspection of the above named vessel having been completed at Spotted Horse, Wyoming on the 22 day of December 19 77 I hereby certify that said vessel is in all respects in conformity with the applicable vessel inspection laws and the rules and regulations prescribed thereunder. The following complement of licensed officers and crew is required to be carried; included in which there must be ---- Certificated Lifeboatmen and 1 Certificated Tankermen:

- Master	- Master & 1st Class Pilot	- Able Seamen	- Chief Engineer	- Firemen/Watertenders
- Chief Mate	- Class Pilot	- Ordinary Seamen	- 1st Assistant Engineer	- Others
- 2d Mate	- Radio Officer	1 Deckhands	- 2d Assistant Engineer	-
- Mate(s)	1 Ocean Operator(s)	-	- Engineer(s)	-

In addition the vessel may carry 12 other persons in the crew, ---- passengers, ---- persons in addition to the crew, and ------------------------ Total persons allowed 14

Route permitted and conditions of operation: COASTWISE: Waters of the United States, not more than 12 miles offshore. When operating within the close proximity of other support vessels, route is unrestricted. Oil recovery operations only.

Cargo tanks must be cleaned and gas freed immediately after each use in an oil recovery operation.

When operated more than 12 hours, an alternate crew shall be provided.

EQUIPMENT AND INSPECTION DATA

Lifesaving equipment provided for 14 persons, viz:
- Lifeboats on port side for ___ persons
- Lifeboats on starboard side for ___ persons
- Motor lifeboats (included in total lifeboats)
- Inflatable liferafts for 15 persons
- Life floats for ___ persons
- ___ persons
2 Ring life buoys - Rescue boats
Life preservers for 14 adults and - children

Stability letter issued -
Drydocked Dec 77
Tail shaft drawn -
Propulsion Motor
Shaft H.P. 300 Fuel Diesel
Pressure vessels examined -

___ BOILERS: Records at ___
Number ___ Year built ___ Type ___
Mfr. X
Mountings opened X
Mountings renewed X
Hydrostatic test X
Maximum steam pressure allowed X

Fire extinguishing systems: Fixed CO$_2$ 100. lb.
Semiportable ___

Fire extinguishers
No. 4 Class BII
2 BI

Fire hose, total length 50 ft.
1 Fire axes
1 Fire pumps

Inspected and approved for the carriage of:
Grade "D" and Lower
Capacity: 90 BBLs

PERIODIC REINSPECTIONS

DATE	INSPECTION ZONE	SIGNATURE

O. L. SHOT
(Officer in Charge, Marine Inspection)

Spotted Horse, Wyoming
(Inspection Zone)

given to their suitability for the proposed operations. In some instances, the hull structure has been required to be strengthened before the vessel could be certificated. In all cases where they have been permitted to carry passengers and in most cases of carrying only cargo, a requirement has been made that bow doors be permanently closed. In the case of some cargo vessels where the bow door was retained, indiscriminate beaching was not permitted, and suitable shore facilities such as "hards" had to be provided.

OCMI's shall continue to give special attention to vessels of the landing craft type. The construction, arrangement, equipment, and material condition of each particular vessel shall be considered in determining whether it is suitable for the proposed operation. Each new request for inspection of such a vessel will necessarily have to be evaluated on its own merits. Unless covered by the following instructions, each new application should be referred to Commandant (G-MVI) with appropriate recommendations from the OCMI.

30–10–95B. LST's

NVC 7–56 and NVC 11–63 contain instructions and information concerning the structural reinforcement, drydocking, and hull inspection requirements for manned and unmanned LST's, respectively. Since the issuance of these circulars, the following additional requirements have been applied:

(1) Further bottom reinforcing in addition to that shown by figure 1 of NVC 7–56 is required so as to provide at least 14 square inches of additional bottom plating sectional area on each side of the centerline. This may be provided by strapping or by increasing the width of the 9/16 inch thick strakes at the centerline and in way of the longitudinal bulkheads.

(2) In general, existing machinery, pressure vessels, piping systems, electrical installations, lifesaving and firefighting equipment, etc., which will not be used, must be either removed or inactivated in such a manner as not to constitute a safety hazard. On the other hand, any original equipment or systems intended for use in the proposed service would be subject to compliance with current regulations governing such installations.

Plans covering in full detail all modifications from the basic LST structure and arrangement, including those called for in NVC 7–56, NVC 11–63, and this subpart, shall be submitted to and approved by Commandant (G-MMT) before any vessel shall be initially certificated. These plans should be submitted as far in advance as practicable of any alterations or operations planned.

30–10–95C. LCU'S, LCM'S, and LCT'S

LCU's, LCM's, and LCT's with their bow door in use have been permitted to carry cargo on waters considered to be semi-protected. In such an operation the following conditions apply:

(1) The OCMI shall be satisfied as to the material condition of the vessels and with regard to equipment requirements.

(2) Appropriate conditions and limitations, including qualifying the routes to reasonable operating conditions, shall be set forth on the Certificate of Inspection.

(3) Provision should be made to overcome the legal responsibility for reporting each grounding. Therefore the following wording should be placed on the Certificates of Inspection of landing craft.

> Notice of casualty in accordance with 46 CFR 97.07-1(a)(3) shall be made for any accidental stranding or grounding and for any intentional grounding which causes or is suspected of having caused damage affecting the seaworthiness of the vessel.

(4) The cargo capacity of these boats shall not be in excess of the following table:

30-10-50B. GROUNDED TANK VESSELS

Questions have been raised as to whether a vessel which is used for the storage of soya bean oil (a Grade E liquid) would be subject to inspection under 46 U.S.C. 391a if she were grounded at a suitable location and not afloat. Information has also been requested concerning the status of such a vessel if it were used for floating storage alongside a dock.

If such a vessel were completely grounded and not afloat, she would not be subject to inspection under 46 U.S.C. 391a. In order to be considered completely grounded, provisions would have to be made to ensure that the vessel remains grounded and fixed at all times, including times of unusually high water. In other words, to avoid inspection, the vessel must be so securely attached to the ground that it is not capable of being used in navigation and is "substantially a land structure." Therefore, unless it meets the provisions of section 30-10-25A, a vessel used for floating storage alongside a dock is subject to inspection and must comply with the requirements of 46 CFR 30-50 (Subchapter D - Tank Vessels).

30-10-50C. PERMANENTLY ANCHORED VESSELS

A permanently anchored vessel with public patronage on board, unless not subject to inspection as provided for in section 30-10-50A, is a passenger vessel engaged in navigation and subject to marine safety requirements, including inspection and certification. Such a vessel, whether self-propelled or not and whether underway or not, while operated as a public restaurant or hotel, would be subject to all statutes and regulations applicable to self-propelled passenger vessels.

30-10-50D. FOREIGN VESSELS

Prior to any determinations by the Coast Guard pertaining to foreign-built vessels intended for use in an immobile status, a determination regarding coastwise trade should be requested from the U.S. Customs Service by the vessel's owner.

30-10-55. BOY SCOUT VESSELS

In order to assist local Boy Scout councils, chartered organizations, and leaders in complying with Coast Guard inspection regulations, the Boy Scouts of America's Exploring Division and the Coast Guard entered into an agreement on 1 October 1979. While the agreement principally discusses the Sea Explorer program, it applies equally to all vessels operated in the interests of the Boy Scouts of America (BSA).

30-10-55A. INSPECTION AGREEMENT

It is the intent of the Exploring Division, BSA that all Sea Explorer vessels, except pulling boats carrying no more than six passengers, will be inspected and certificated. The Coast Guard will, upon proper application, inspect a Sea Explorer vessel and issue a COI when the vessel is found to comply with the appropriate regulations.

30-10-55B. APPLICABLE VESSEL REGULATIONS

The Rules and Regulations for Small Passenger Vessels, 46 CFR 175-187 (Subchapter T) are applicable to those vessels required to be certificated, or for which inspection is requested in accordance with this agreement.

The Rules and Regulations for Uninspected Vessels, 46 CFR 24-26 (Subchapter C) are applicable to those vessels not requiring certification.

30-10-55C. VESSELS REQUIRED TO BE INSPECTED

All Sea Explorer vessels 65 feet or less in length, which carry more than six passengers as defined in 46 U.S.C. 390(a), are required to be inspected and certificated under the provisions of Subchapter T.

Sea Explorer vessels of 100 G.T. or more may be inspected under Subchapter T. Where the provisions of Subchapter T are unsuitable, the provisions of Marine Engineering Regulations (Subchapter F), Rules and Regulations for Passenger Vessels (Subchapter H), and Electrical Engineering Regulations (Subchapter J) shall be used. The OCMI certificating the vessel shall determine the minimum manning requirements. The certificating officer may tailor a license examination covering minimum professional requirements only, and restrict the licensee to a particular vessel.

30-10-55D. VESSELS INSPECTED UNDER AGREEMENT

Certificates of Inspection may be issued to powered Sea Explorer vessels 65 feet or less in length and Sea Explorer sailing vessels under 700 G.T. which carry six passengers or less, upon successful completion of inspection under Subchapter T. Such vessels, when uninspected, must comply with the appropriate regulations of Subchapter C; annual application for a USCG Auxiliary Courtesy Motorboat Examination is encouraged.

(1) The OCMI must be satisfied as to the material condition of the vessel and its meeting of equipment requirements;

(2) Appropriate conditions and limitations, including the qualification of routes to reasonable operating conditions, shall be stated on the COI;

(3) Provisions should be made to overcome legal requirements to report each grounding. Therefore, the following statement shall be entered on the COI of a landing craft:

"Notice of casualty in accordance with 46 CFR 97.07-1 (a)(3) shall be made for any accidental stranding or grounding and for any intentional grounding which causes or is suspected of having caused damage affecting the seaworthiness of the vessel";

(4) The cargo capacity of such vessels shall not exceed that prescribed by the following table:

VESSEL & LENGTH	PROTECTED WATERS/ NO BEACHING	SEMI-PROTECTED WATERS/ BEACHING
LCM (50, 56 ft)	30 Tons (Short)	20 Tons
LCT (117, 120 ft)	150 Tons	100 Tons

(5) Bow and stern sections of LCT's shall be welded to center sections.

30-10-100. YACHTS

30-10-100A. GENERAL

Yachts are not exempt from vessel inspection laws, and are treated as any other motor-propelled vessel in the application of the laws.

30-10-100B. STEAM-PROPELLED YACHTS

On 6 October 1981, Public Law 96-378 came into effect. One of the effects of this law was to change the inspection requirements for steam-propelled yachts contained in 46 U.S.C. 526 and 46 U.S.C. 404. The latter statute now requires that all steam-propelled yachts shall have their hulls and boilers inspected. Yachts are miscellaneous vessels and will be inspected and certificated under Subchapter I. Existing yachts that were not previously certificated will be certificated by complying with such rules and regulations under Subchapter I as may be deemed necessary and appropriate by the OCMI for the safe operation/ navigation of these vessels.

30-10-100C. MOTOR-PROPELLED YACHTS

Motor-propelled yachts of 300 or more G.T. operating coastwise or on the high seas are subject to full inspection for certification under Subchapter I (as provided by 46 U.S.C. 367).

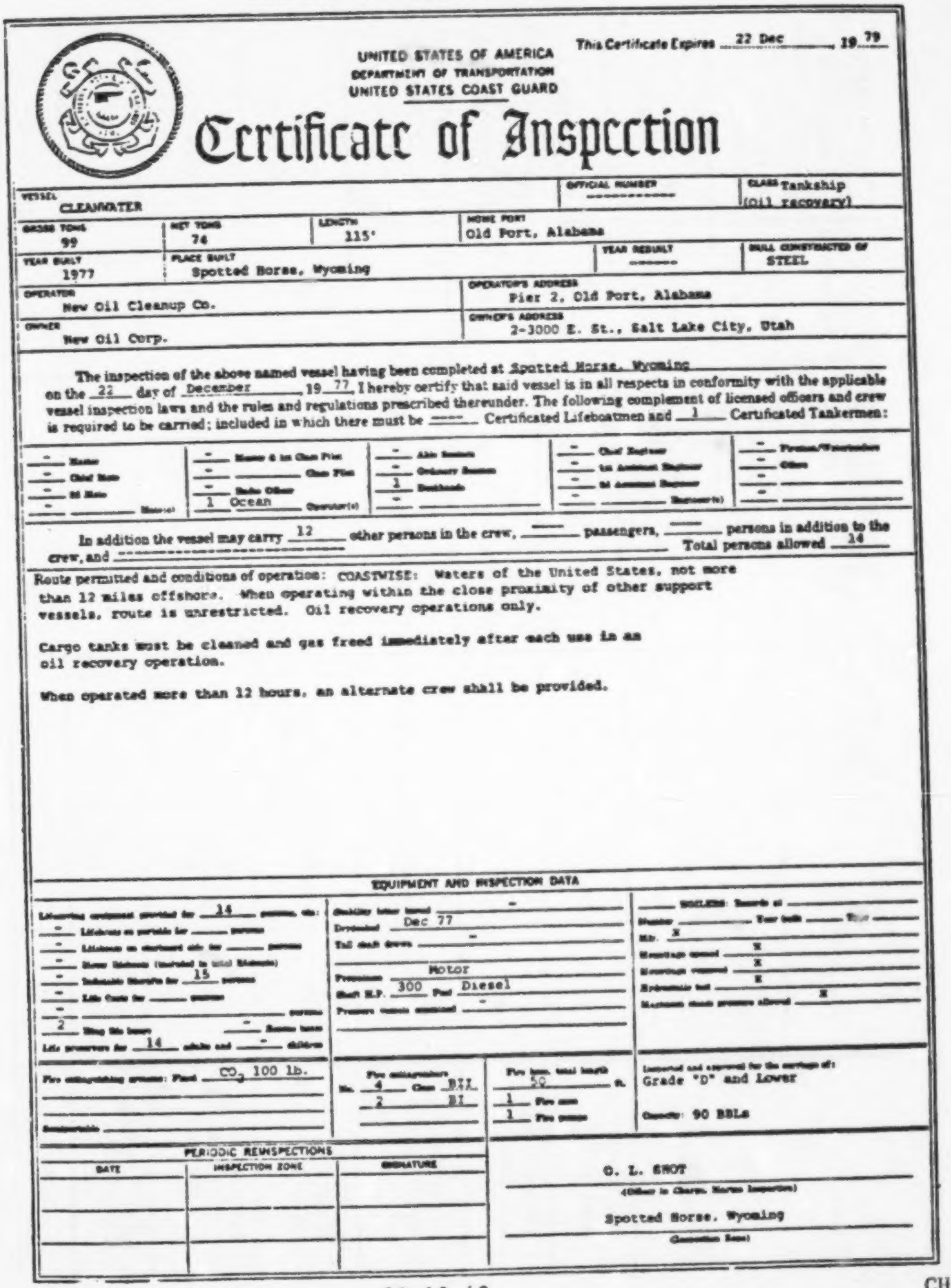
30-10-100D. MANNING

Subpart 52-6-55 (Volume III of this manual) discusses manning standards for pleasure yachts.

30-10-105. FISHING AND FISHERY-RELATED VESSELS

Fishing and fishery-related vessels, such as fishery tenders, canning tenders, and fish assembling and processing vessels, are not exempt from vessel inspection laws. However, exclusionary clauses have been added to certain inspection laws which make it difficult to ascertain which requirements apply to which types of fishery-related vessels. Plate 30-10-105.1 delineates the regulations which apply to various types of fishing and fishery-related vessels.

PLATE 30-10-90D.1
SAMPLE CERTIFICATE OF INSPECTION FOR OIL-RECOVERY VESSEL



This Certificate Expires 22 Dec 19 79

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Certificate of Inspection

VESSEL CLEANWATER			OFFICIAL NUMBER ----------	CLASS Tankship (Oil recovery)
GROSS TONS 99	NET TONS 74	LENGTH 115'	HOME PORT Old Port, Alabama	
YEAR BUILT 1977	PLACE BUILT Spotted Horse, Wyoming		YEAR REBUILT ------	HULL CONSTRUCTED OF STEEL
OPERATOR New Oil Cleanup Co.			OPERATOR'S ADDRESS Pier 2, Old Port, Alabama	
OWNER New Oil Corp.			OWNER'S ADDRESS 2-3000 E. St., Salt Lake City, Utah	

The inspection of the above named vessel having been completed at Spotted Horse, Wyoming on the 22 day of December 19 77, I hereby certify that said vessel is in all respects in conformity with the applicable vessel inspection laws and the rules and regulations prescribed thereunder. The following complement of licensed officers and crew is required to be carried; included in which there must be ---- Certificated Lifeboatmen and 1 Certificated Tankermen:

- Master	- Master & 1st Class Pilot	- Able Seamen	- Chief Engineer	- Firemen/Watertenders
- Chief Mate	- Class Pilot	- Ordinary Seamen	- 1st Assistant Engineer	- Oilers
- 2d Mate	- Radio Officer	1 Deckhands	- 2d Assistant Engineer	-
- Mate(s)	1 Ocean Operator(s)	-	- Engineer(s)	-

In addition the vessel may carry 12 other persons in the crew, ---- passengers, ---- persons in addition to the crew, and ---------------------- Total persons allowed 14

Route permitted and conditions of operation: COASTWISE: Waters of the United States, not more than 12 miles offshore. When operating within the close proximity of other support vessels, route is unrestricted. Oil recovery operations only.

Cargo tanks must be cleaned and gas freed immediately after each use in an oil recovery operation.

When operated more than 12 hours, an alternate crew shall be provided.

EQUIPMENT AND INSPECTION DATA

Lifesaving equipment provided for 14 persons, viz:
- Lifeboats on port side for ____ persons
- Lifeboats on starboard side for ____ persons
- Motor lifeboats (included in total lifeboats)
- Inflatable liferafts for 15 persons
- Life floats for ____ persons
- ____ persons
2 Ring life buoys - Buoyant apparatus
Life preservers for 14 adults and - children

Stability letter issued -
Drydocked Dec 77
Tail shaft drawn -
Propulsion Motor
Shaft H.P. 300 Fuel Diesel
Pressure vessels examined -

____ BOILERS: Records of ____
Number ____ Year built ____ Type ____
M.D. X
Mountings opened X
Mountings renewed X
Hydrostatic test X
Maximum steam pressure allowed X

Fire extinguishing systems: Fixed CO2 100 lb.
Sprinklers ____

Fire extinguishers
No. 4 Class BII
2 BI

Fire hose, total length 50 ft.
1 Fire axes
1 Fire pumps

Inspected and approved for the carriage of:
Grade "D" and Lower
Capacity: 90 BBLs

PERIODIC REINSPECTIONS

DATE	INSPECTION ZONE	SIGNATURE

O. L. SHOT
(Officer in Charge, Marine Inspection)

Spotted Horse, Wyoming
(Inspection Zone)

PLATE 30-10-105.1

REGULATIONS PERTAINING TO FISHING AND FISHERY-RELATED VESSELS

	FISHING VESSEL		FISHERY & CANNERY TENDER VESSELS ENGAGED IN SALMON OR CRAB FISHERIES OF THE PACIFIC NORTHWEST		FISH ASSEMBLING AND PROCESSING VESSELS OPERATING IN THE PACIFIC NORTHWEST		FISHERY & CANNERY TENDER VESSELS & FISH ASSEMBLING & PROCESSING VESSELS NOT OPERATING IN THE PACIFIC NORTHWEST
	LESS THAN 200 G.T.	200+ G.T.	LESS THAN 500 G.T.	500+ G.T.	LESS THAN 5000 G.T.	5000+ G.T.	
LICENSING[7]	NO	YES 46 CFR 10	YES 46 CFR 10 IF 200+ G.T.	YES 46 CFR 10	YES 46 CFR 10 IF 200+ G.T.	YES 46 CFR 10	YES 46 CFR 10 IF 200+ G.T.
COASTWISE LOAD LINE	NO	NO	46 CFR 42[1]	YES	[2]	YES	YES, IF 150+ G.T.
INTERNATIONAL LOAD LINE	NO	NO	[8]	YES 46 CFR 42	[8]	YES	YES, IF NEW VSL OVER 79' OR EXISTING VSL 150+ G.T.
INSPECTION FOR CERTIFICATION	NO 46 CFR 24-26	NO 46 CFR 24-26	NO[3] 46 CFR 24-26	YES 46 CFR 90-98	NO 46 CFR 24-26	YES 46 CFR 90-98	YES, IF 300+ G.T.
DISPENSING PETROLEUM PRODUCTS	NO[4]	NO[4]	YES 46 CFR 105	YES 46 CFR 105	YES 46 CFR 105	YES 46 CFR 90	YES 46 CFR 90
NAVIGATION SAFETY REGS (33 CFR 164)	NO	YES IF 1600+ G.T.	NO	YES IF 1600+ G.T.	YES IF 1600+ G.T.	YES	YES IF 1600+ G.T.
PORT & TANKER SAFETY ACT OF 1978	[9] [10]	[9] [10]	NO	YES	NO	YES	YES
SOLAS	NO	NO	NO	YES	YES	YES	YES IF 500+ G.T.
POLLUTION PREVENTION	33 CFR 155[5] ; 33 CFR 156[6]						
MSD'S	33 CFR 159						

VESSEL DOCUMENTATION (46 CFR 67)

PLATE 30-10-105.1 (cont.)

NOTES:

1. Such vessels built before 11 July 1968 or converted before 11 July 1973 are exempt from loadline requirements.
2. This does not apply to vessels under 150 G.T. or built before 15 August 1974 or converted prior to 1 January 1983.
3. Such vessels are exempt from inspection until 1 January 1983.
4. For vessels engaged in salmon or crab fisheries, see 46 CFR 105.
5. Certain regulations of this part apply to vessels over 100 G.T. or under 100 G.T.
6. Vessels that have a capacity of less than 250 barrels are exempt.
7. Merchant Mariner's Documents are required of all seamen on vessels over 100 G.T., except vessels employed exclusively on the navigable rivers of the U.S.
8. This applies to new vessels over 79 feet in length and existing vessels over 150 G.T.
9. Fishing vessels less than 500 G.T. used for the salmon or crab fisheries of the states of Oregon, Washington, and Alaska, when engaged exclusively in the fishing industry, are exempt.
10. Fishing vessels under 300 G.T. are not required to possess or use equipment or devices required under Section 4 of the act.

PART 30-11—VESSELS CARRYING HAZARDOUS MATERIAL IN BULK

30-11-1. INTRODUCTION

The number and variety of unconventional liquid cargoes being transported in bulk by water are steadily increasing. Although the transportation and inspection hazards of common petroleum products are generally well understood, newer commodities often have unusual fire and explosion properties (such as a wide flammable range, low ignition temperature, and foam incompatibility) in addition to other hazards such as toxicity and dangerous reactivity. It is becoming increasingly evident that marine safety personnel should be aware that there can be special circumstances involved with the inspection of vessels carrying hazardous materials. The purpose of this part is to outline some of the unique problems and situations which could be encountered.

30-11-5. INSPECTION OF VENTING SYSTEMS

There are a number of products being transported in tank vessels that are capable of plugging or coating flame screens, and in some instances, capable of plugging vent lines and pressure relief valves in cargo transfer piping. One class of chemicals which may cause these problems are solids shipped in the molten form such as phenol and sulfur. Hot vapors from these liquids rise and may condense on the cooler vent pipes, coating the vent lines and flame screens (if they are used). Plugged lines may eventually occur if they are not cleaned when coatings begin to build up. In severe cases, heating system trace lines may be necessary for cargo, relief, and vent lines.

Safety of personnel must also be considered. Condensing vapors of toxic products may fall to the deck such as to endanger personnel. In many cases, the first loading and discharge of toxic cargoes should be witnessed to ensure that all recognizable factors of personnel safety have been considered in the design of the system.

Another class of chemicals causing similar problems are the monomers. Examples of these self-reactive chemicals are styrene, ethyl acrylate, methyl methacrylate, and vinyl acetate. Although inhibited in the liquid phase to help prevent self-reaction, the vapors are uninhibited and may polymerize on the walls of the vent lines and on flame screens. A buildup can occur after several years of service, and in some cases, in considerably less time. Overfilling of a tank, or sloshing during a voyage, can also deposit liquid in the horizontal runs (if present) of a vent system which will solidify after depletion of the inhibitor.

Because of the potential problems of coated flame screens and blockages of vent lines, these systems should be examined at each scheduled inspection to determine if chemical buildup is occurring. Cleaning may be necessary if substantial coating is noted. Buildup caused by monomer polymerization may be very difficult to remove and may require special solvents, scraping, or high temperatures. The owner or operator should be instructed that an active maintenance program is needed to preclude the defeat of safety equipment by polymer buildup.

30-11-10. VESSELS CARRYING CERTAIN DANGEROUS CARGOES

30-11-10A. GENERAL

All marine safety personnel who are involved in the inspection of vessels carrying certain flammable or combustible dangerous cargoes in bulk shall become familiar with the regulations contained in 46 CFR Parts 40, 151, 153, and the properties of those products which can be found in the CHRIS Manuals (CG-446-1, 2, and 3).

The regulations at 46 CFR 40.05-1(c) state that tanks being taken out of the ethylene oxide service, or being returned to such service, be "...adequately cleaned to the satisfaction of the marine inspector." In this regard, there should be no evidence of residue, and a chemist's certificate should be provided.

The dangers presented by alkylene oxides, such as ethylene oxide or propylene oxide, are threefold:

(1) Alkylene oxides present a severe explosion hazard.

(2) Alkylene oxides are carried under a nitrogen pad because, when in contact with air, they polymerize. Any residual cargo can react in this manner and foul piping and fittings.

(3) Alkylene oxides are highly reactive, and may not be compatible with the alternate cargo. Saturated hydrocarbons (propane, butane, etc.) present no such problems. However, alkylene oxides can react violently, and in some cases explosively, with acids, bases, alcohols, aldehydes, and amines, and with many other compounds as well.

30-11-10B. CLEANING OF TANKS

For the foregoing reasons, the importance of thorough tank cleaning cannot be overemphasized. The following methods would result in the satisfactory cleaning of a tank in the following two situations:

(1) Removal of a tank from alkylene oxide service:

(a) Purge tank with an inert gas (carbon dioxide or nitrogen) to flush out the alkylene oxide vapor.

(b) Wash out the tank with water.

(c) Remove polymerized alkylene oxide, which may appear as a thick, gummy deposit, by flushing with water at a temperature not below 180°F for several hours. If polymer appears in pipe lines and fittings, as evidenced by thick, gummy deposits, the hot water flushing treatment must be routed through such lines and fittings.

(2) Return of a tank to alkylene oxide service: (This situation is potentially more dangerous than (1) above. A small amount of certain impurities, some of which are listed in the footnote to 46 CFR 40.05–2(b), may trigger off a runaway reaction which will continue until either the entire mass explodes or all of the alkylene oxide has reacted. Iron oxide (rust) is one of the agents which can initiate a reaction.)

(a) Determine whether the previous cargo is soluble in water or another solvent compatible with alkylene oxide, in order to select a satisfactory washing agent.

(b) After a thorough cleaning of the tank, inspect it to insure that it is clean, dry, and free of rust.

(c) Purge the tank atmosphere with inert gas in order to displace the air prior to pumping in the alkylene oxide.

The methods outlined above are not necessarily the only satisfactory procedures. Prior to commencing an inspection in accordance with 46 CFR 40.05–1(c), the inspector should familiarize himself with the procedures planned for the particular tank. If the method is consistent with good cleaning practice as outlined by a recognized authority, such as the Manufacturing Chemists Association, Inc., or the National Fire Protection Association (NFPA), the inspector should permit the alternate method to be used. When the cleaning is completed to his satisfaction, and the tank is inerted, the inspector may permit alkylene oxide to be loaded aboard, after an amendment to the Certificate of Inspection is authorized by the cognizant OCMI.

PART 30-12—INSPECTION OF GOVERNMENT VESSELS

30-12-1. GENERAL

Public vessels of the United States, other than those owned or operated by the Department of Commerce (Maritime Administration), are not, in general, required by law to be inspected and certificated. However, several Government agencies which operate vessels have requested the Coast Guard to assist them in carrying out safety inspections on their vessels. In some cases, the inspection requested is a full inspection for certification with the issuance of a Certificate of Inspection. In other cases, a complete inspection is desired but compliance with all the requirements of the regulations is not intended. In still other cases, inspections of limited scope or examination of specific items are requested. The Coast Guard has attempted to cooperate with these agencies in meeting their safety objectives by carrying out the requested inspections in accordance with an "inspection agreement" when resources permit. Public vessels which are determined to be subject to inspection under the navigation and vessel inspection laws shall be inspected under the applicable regulations in title 46 CFR.

30-12-5. REFERENCES

30-15-5A. LAWS

30-12-5A(1). 46 U.S.C. 362. This law excepts "public vessels of the United States" from the inspection provisions of title 52 of the Revised Statutes.

30-12-5A(2). 46 U.S.C. 363. This law provides that vessels owned and operated by the Department of Commerce (i.e., MARAD and NOAA) be inspected as if they were privately owned based on their service, tonnage, etc. A vessel that is not required to be inspected under the various inspection laws is treated as an uninspected vessel.

30-12-5B. REGULATIONS

The regulations explaining the application of inspection requirements to public vessels include the following:

- Passenger Vessels – 46 CFR 70.05-1(a)(3)
- Cargo & Miscellaneous Vessels – 46 CFR 90.05-1(a)(4)
- Tank Vessels – 46 CFR 30.01-5(d)(3)
- Small Passenger Vessels – 46 CFR 175.05-1(a)(5)
- Marine Engineering – 46 CFR 50.01-15
- Electrical Engineering – 46 CFR 110.05-1(a)(5)
- Public Nautical Schoolships – 46 CFR 167
- Oceanographic Vessels – 46 CFR 188.05-1

30-12-10. INSPECTION PROCEDURES

Upon satisfactory completion of an inspection for certification, the OCMI shall issue the vessel a Certificate of Inspection (Form CG-841 or CG-3753, as appropriate). The Governmental agency involved may, upon request, obtain a copy of the certificate. Unless a public vessel is able to comply with all of the requirements of the applicable regulations (except as modified by agreement or additional instructions), no Certificate of Inspection shall be issued. Instead, a letter will be addressed to the agency controlling the vessel, setting forth the extent of the inspection and any deficiencies noted.

For certain vessels, agreements have been made to accept equipment or other standard specifications as equivalent to that specified in the regulations. These equivalents are described in this part. Inspectors are expected to exercise the same degree of care and diligence in the detection of deficiencies on Government vessels as is required in the inspection of privately owned vessels.

Application for inspection shall be addressed to the OCMI in whose zone the inspection is to be made. Such application shall be on form CG-3752. Inspection reports shall be made in the same manner as for privately owned vessels insofar as practicable; i.e., in the appropriate CG-840 booklet form. Special report forms may be used to cover limited inspections. Reports of all inspections shall be filed by the OCMI.

30–12–15. MISCELLANEOUS DECISIONS AND INTERPRETATIONS

30–12–15A. "PUBLIC VESSELS" AS USED IN 46 U.S.C. 362

The term ,"public vessels of the United States," as used in 46 U.S.C. 362 to except these vessels from inspection requirements, is deemed to mean vessels which are:

(1) Used for a public purpose, not in trade or commerce, and

(2) Owned outright by the United States. (It is not sufficient that the United States holds the vessel under a bareboat charter.)

The connotation of "public purpose" is believed to exclude the purposes of trade or commerce although such trade or commerce may be governmental. It should be recognized, however, that vessels owned by the United States and used primarily for public purposes will sometimes engage incidentally in trade or commerce. When the trade or commerce is only incidental, it is believed that the vessel remains a public vessel. In other words, the incidental use would not violate the primary use. The term "owned" has been consistently and uniformly interpreted by persons charged with the administration of 46 U.S.C. 362 to include only those vessels in which title is actually vested in the United States. Thus a privately owned merchant vessel which is demise-chartered to the United States is not a public vessel within the meaning of 46 U.S.C. 362, as amended, because creation of ownership for the time being *pro hac vice* (i.e., for this turn or occasion) does not result in transfer of title or in the title becoming vested in such owner *pro hac vice*. A vessel to which the United States has actual title and which is used by the United States in the discharge of its Constitutional functions is a "public vessel of the United States" within the meaning of 46 U.S.C. 362, notwithstanding that she is incidentally used on occasion for trade or commerce, including the carrying of passengers for hire. On the other hand, if the actual title to the vessel is not in the United States (even though the United States is charterer under a demise charter) or if title is in the United States and the vessel is primarily used in commerce or trade including the carriage of passengers for hire, the vessel is not a public vessel within the meaning of 46 U.S.C. 362.

State or municipally owned vessels such as fireboats, ice-breakers, etc., and Federally owned vessels used for state or municipal purposes, such as ferryboats, would not be considered as coming within the statutory exception of title 52 of the Revised Statutes relating to the inspection of vessel

30–12–15B. STATE-OWNED VESSELS

Inquiries have been received by the Commandant as to whether a motor vessel owned by a state and operated as a free ferry is subject to inspection by the Coast Guard. It has been determined that if the vessel falls within the purview of 46 U.S.C. 390–390g, it is subject to inspection and certification by the Coast Guard, since public vessels of a state are not expressely or impliedly excepted from the requirements of that law. However, if such a vessel is above 15 gross tons *and* in excess of 65 feet in length so as to fall under 46 U.S.C. 404 *and* is operated as a "free ferry," it is not considered to be carrying passengers for hire and therefore is not subject to inspection and certification by the Coast Guard under that law. However, if these passengers pay a fare, the vessel would be subject to inspection.

The carriage of passengers notwithstanding, any vessel carrying combustible or flammable liquids and/or certain dangerous cargoes in bulk (more than 110 U.S. gallons), by any means (i.e., in integral or portable tanks, and/or vehicles), is subject to certification or permit requirements.

30-12-15C. RECREATIONAL MOTORBOATS AT MILITARY INSTALLATIONS

An inquiry has been received by the Commandant as to whether recreational motorboats, owned by a nonappropriated fund activity of a U.S. Air Force base, were subject to the requirements of 46 U.S.C. 390. Military personnel assigned or attached to the base, and their guests, are accorded the privilege of using the vessels for a small fee. The Chief Counsel of the Coast Guard has replied in part that because the operation is an authorized nonappropriated fund activity and operates under the direct supervision of the Air Force base command, the vessels are "public vessels" and, as such, are not subject to inspection. However, these vessels are subject to the applicable recreational boat laws and regulations (see 46 U.S.C. 1451 and 1453).

In the event that operators are provided with the boats, they must possess Coast Guard licenses suitable for the tonnage and route (see 46 U.S.C. 1461(e)).

30-12-20. VESSELS OF THE MILITARY SEALIFT COMMAND (MSC)

30-12-20A. INSPECTION AGREEMENT WITH MSC

The Commander, Military Sealift Command, U.S. Navy, has requested that the Coast Guard inspect and certificate MSC vessels of the merchant type which are civilian manned. These vessels are normally designated "MSC, in service, civilian manned." The term "in service", as applied to vessels of the MSC, refers to those vessels which are manned by civil or merchant marine crews in contradistinction to those vessels which are manned by naval crews and which are termed "in commission." MSC intends that no such vessel proceed to sea until such time as a Certificate of Inspection is issued indicating that the vessel complies with the applicable rules and regulations of the Coast Guard, unless military considerations make it necessary to dispatch the vessel without such certification. However, the Coast Guard will not normally be asked to certificate the following group of "MSC, in service, civilian manned" vessels:

(1) Those vessels assigned to the control of Commander, Military Sealift Command, Far East Area (COMSCFEAREA),

(2) Vessels of the landing craft type, such as LST's and LCVP's, and

(3) Vessels essentially military in character by virtue of mission assignment or construction standards, such as T-AK and T-ARC.

The Coast Guard will inspect all MSC vessels for which an application for inspection is received. This inspection shall be for the purpose of determining condition and compliance with the applicable regulations. OCMI's shall certificate those vessels found to be in substantial compliance with the regulations (as modified by agreement or additional instructions) and they shall not issue Certificates of Inspection to such MSC vessels unless compliance has been attained.

30-12-20B. APPLICATION OF SOLAS 60

"MSC, in service, civilian manned" vessels, being vessels of the Department of Defense and used for public purposes, are not subject to the provisions of the International Convention for Safety of Life at Sea, 1960, and shall not be furnished with convention certificates. This provision does not apply to those vessels on time charter to the MSC from the Maritime Administration, U.S. Department of Commerce.

30-12-20C. MODIFICATIONS TO CERTIFICATES OF INSPECTION

30-12-20C(1). General. An asterisk shall be inserted at the word "thereunder" in the eighth line of the Certificate of Inspection (form CG-841), and in the blank space for "Route permitted and conditions of operation:" there shall be inserted an asterisk and the notation "In accordance with the standards applicable to MSC vessels".

30-12-20C(2). Class. In the space provided on the Certificate of Inspection for the word "CLASS" there shall be entered "Naval transport, in service, civilian manned"; "Naval cargo vessel, in service, civilian manned"; or "Naval tankship, in service, civilian manned", as appropriate.

30-12-20C(3). Manning. In the case of P2's, C3's, and C4's operated by MSC, to insure that three additional AB's are carried and not be required to stand watches, three additional persons in possession of an AB document shall be required in the persons authorized to be carried in the crew. See chapter 48 for entries on the Certificate of Inspection.

30-12-20C(4). Persons in Addition to Crew. Inspected MSC vessels, when determined necessary in the interest of national defense by the Commander, Military Sealift Command, may carry civilian and/or military personnel for the express purpose of carrying out the business of the vessel. Such personnel will not be involved in the navigation of the vessel, will not be considered members of the crew, nor will they be considered passengers. The carriage of such personnel shall be indicated by separate endorsement on the Certificate of Inspection and shall also be reflected in the total persons allowed (see chapter 48).

30-12-20D. MODIFICATION AND EXPLANATION OF STANDARDS

30-12-20D(1). General. In addition to material approved by the Coast Guard, the OCMI may accept material and equipment found on vessels operated by the MSC which meet the requirements of:

- The American Society of Mechanical Engineers (AMSE).
- The Institute of Electrical and Electronic Engineers (IEEE).
- The American Bureau of Shipping (ABS).
- The technical bureaus of the Department of the Navy.
- Military (JAN or MIL) specifications.
- Federal specifications used for military purchases.
- National Military Establishment specifications (NME).

30-12-20D(2). Vessels of Special Design. In the case of MSC vessels of special design, the Commandant may, in individual cases, permit such variations from the requirements of law and regulations as may be shown to be necessary for the special purposes for which such vessels are designed. The initial inspection files shall contain correspondence and other information on the variations authorized and should be consulted at subsequent inspections for certification.

30-12-20D(3). Structural Steel Renewals. Structural steel renewals must be at least inclusive of the minimum requirements of the Coast Guard and the American Bureau of Shipping.

30-12-20D(4). Lifesaving Equipment. Requirements for lifesaving equipment on regularly inspected vessels and as modified for MSC vessels are shown in table 30-12-20D(4).1. Percentages are based on the total number of persons on board.

30-12-20D(5). Pyrotechnics. Navy pyrotechnics may be accepted in lieu of Coast Guard-approved pyrotechnics as indicated in the comparison list in table 30-12-20D(5).1.

30-12-20D(6). Life Floats. Normally, U.S. Navy life floats will be identified by nameplates complying with the provisions of Military Specification MIL-F-16143. These are acceptable for use if they are in good condition.

30-12-20D(7). Emergency Drinking Water. Emergency drinking water manufactured under Military Specification MIL-W-15117 may be accepted in lieu of Coast Guard-approved drinking water on all Navy-owned ships operated by the Military Sealift Command that are inspected and certificated by the Coast Guard. Military Specification MIL-W-15117 water cans are undated and the water may remain in service for an indefinite period. Rejection shall be based upon deteriorated cans or other defects which, in the judgment of the inspector, make the water unusable. Coast Guard-approved water will continue to be rejected after a service life of 5 years.

30–12–20E. INSPECTION WAIVERS

Waivers of compliance with the provisions of the navigation and vessel inspection laws administered by the Coast Guard, for vessels operated by or chartered to MSC, are made in accordance with the regulations in 46 CFR 6.06.

30–12–25. VESSELS OF THE ARMY CORPS OF ENGINEERS

30–12–25A. INSPECTION AGREEMENT

The Coast Guard, upon proper application, will inspect vessels of the U.S. Army Corps of Engineers (COE) and will issue a Certificate of Inspection to such vessels when they are found to comply with the applicable vessel inspection laws and regulations. In any case after inspection, when it is found that a Certificate of Inspection should not be issued, the applicant for inspection will be furnished with a written statement setting forth the particulars in which the vessel fails to meet Coast Guard requirements.

30–12–25B. MODIFICATION OF STANDARDS

30–12–25B(1). Lifesaving Equipment. At the request of the Chief of Engineers, the Commandant has approved acceptance of MIL-R-0016847 Unicellular Plastic Lifesaving Ring Buoys for use on COE vessels.

An agreement was also reached with the COE whereby the safety standards of lifesaving equipment on their vessels have been improved. They have agreed to replace unicellular plastic foam work vests, MIL-L-17653, with Coast Guard-approved life preservers. The work vests will be replaced on all vessels, except those engaged on river routes only, in an amount specified by Coast Guard rules and regulations. The requirement for Coast Guard-approved life preservers was effective on 1 May 1967. Inspected vessels of the Corps of Engineers shall be required to replace work vests with approved life preservers at each inspection for certification. Buoyant work vests may be retained for use by crewmembers working near or over the water as provided by applicable regulations.

30–12–25B(2). Manning. Refer to 52–6–20A for the manning standards on COE vessels.

30–12–30. USN-USCG INSPECTION AND CERTIFICATION AGREEMENT FOR INSTRUMENTATION SHIPS

30–12–30A. GENERAL

Special purpose ships which are owned by the United States and operated as public vessels, which serve as mobile instrumentation facilities for DOD and NASA missile and space programs, are classed as instrumentation ships. The ships are under the control of the Commander, Military Sealift Command (COMSC).

30–12–30B. CERTIFICATES OF INSPECTION

The Department of Defense desires that all instrumentation ships be in posession of a valid Coast Guard Certificate of Inspection (form CG-841).

The entry for "Total persons allowed" on the Certificate of Inspection shall be the maximum number that the Coast Guard will permit. (Normally, the capacity of the primary lifesaving equipment on board will be the determining factor.) When these vessels are manned by military crews, upon satisfactory completion of such inspection, the vessel will be issued a Letter of Inspection in lieu of a Certificate of Inspection. When these vessels are operated by civilian crews, such vessels will be issued a Certificate of

Inspection (form CG-841). Civilian crewmembers will be required to be licensed or certificated as a condition of employment.

The regulations in 46 CFR Subchapter I-Cargo and Miscellaneous Vessels, are applicable to instrumentation ships, insofar as they reasonably apply. In cases where the number of persons in excess of normal manning standards are carried, or the vessel departs significantly from "cargo ship" configuration, additional requirements such as improved access and fire protection may be made to insure the maintenance of a reasonable standard of safety.

30-12-30C. ELECTRICAL DISTRIBUTION SYSTEMS FOR SPECIAL INSTRUMENTATION EQUIPMENT

In regard to special instrumentation equipment, the Coast Guard exercises jurisdiction for plan approval and inspection only up to the point of the ship's electrical power takeoff. In this respect, it is recognized that the Coast Guard will also be concerned with any fire hazard, personnel hazard, or any interference to the ship's service power or main propulsion power that this equipment might present.

30-12-30D. MANNING.

The Coast Guard specifies the instrumentation ship's minimum manning requirements on the Certificate of Inspection; however, the Coast Guard does not limit the categories of persons on board. For operation under a Certificate of Inspection, the Commandant requires that these vessels be manned with properly licensed and certificated personnel in the deck, engine, steward, and staff departments.

All persons on board instrumentation ships, other than those persons engaged in the deck, engine, steward, or staff departments, are not considered as either passengers or crew but as "other persons employed or engaged...in the business of that vessel" (see 46 CFR 90.10-29). Such persons will not be required to hold a Coast Guard license or document, nor to sign shipping articles.

30-12-30E. CREW ACCOMMODATIONS

The requirements for accommodations contained in 46 CFR 92.20 do not apply to "other persons employed or engaged...in the business of that vessel."

30-12-30F. SAILING UNDER SPECIAL CONDITIONS

Upon certain unforeseen conditions and due to the exigencies of a mission, it may become necessary for instrumentation ships to sail under conditions not permitted by the Certificate of Inspection. When such conditions prevail, COMSC will authorize the ship to sail as a public vessel without complying with the terms of the Certificate of Inspection. In such cases, Commandant (G-MVI) or the district commander will be informed by the MSC.

30-12-30G. SHIPMENT AND DISCHARGE

The shipment and discharge of crewmembers on instrumentation ships, except civil service manned ships, described in 30-12-30D above, shall be in accordance with the laws and regulations applicable to vessels of the United States. It is understood that individual exemptions from this agreement will be evaluated upon request by an appropriate Defense Department official.

30-12-30H. CASUALTY REVIEW

Civil service and military-manned instrumentation ships and their masters or commanding officers (as appropriate) are not required to report marine casualties to the Coast Guard, and the Coast Guard will not investigate such casualties except when specifically requested by the Department of Defense. Contract-operated instrumentation ships and their masters are required to report marine casualties to the Coast Guard, and the Coast Guard *will* investigate such casualties *except* when the Department of

Defense specifically requests that there be no investigation.

30-12-30I. DISCIPLINARY ACTIONS

Necessary disciplinary actions shall be taken in accordance with existing agreements, modified as necessary, between the Coast Guard and MSC.

30-12-30J. LIFESAVING EQUIPMENT

The requirements for lifesaving equipment on instrumentation ships are as follows:

(1) Lifeboats – approved under 46 CFR 160.035 – 200% requirement. (Note: If the vessel meets the requirements for one-compartment subdivision and damage stability in accordance with 46 CFR parts 73 and 74, lifeboats for only 100% will be required.)

(2) Life Preservers – approved under 46 CFR 160.002, 160.005, 160.055, or USN MIL-L-10845 – 100% requirement.

(3) Inflatable Life Rafts – approved under 46 CFR 160.051 – requirements: 46 CFR 94.10-55 provides for certain substitutes of inflatable life rafts for lifeboats. In addition, on vessels of 3000 gross tons and over, inflatable life rafts may be substituted for lifeboats under the same arrangements for substitution that are provided on vessels of 1600 gross tons and upwards to 3000 gross tons.

30-12-30K. PYROTECHNICS

U.S. Navy pyrotechnics are acceptable.

30-12-30L. PLAN APPROVAL

Required plan approval for new construction, conversion, and alteration will be carried out in accordance with applicable Coast Guard rules and regulations.

30-12-30M. REPAIRS AND ALTERATIONS

Notices of repairs or alterations shall be submitted to the Coast Guard in accordance with 46 CFR 91.45-1. Inspections of such alterations or repairs shall be accomplished in accordance wtih 46 CFR 91.45-5.

30-12-35. NOAA VESSELS

30-12-35A. LIFEBOATAGE

Vessels of the National Oceanic and Atmospheric Administration (NOAA), which meet the requirements for one-compartment subdivision and damage stability in accordance with 46 CFR Parts 73 and 74, require only 100% lifeboatage.

30-12-40. COMMERCIAL FISHING VESSELS CHARTERED BY THE NMFS

30-12-40A. GENERAL

The vessels covered by an inspection agreement with the National Marine Fisheries Service (NMFS) are those commercial fishing vessels which are chartered by the NMFS, U.S. Department of Commerce, for regulatory and research purposes. The Coast Guard has entered into the inspection agreement to assist NMFS in performing its functions safely. The inspections conducted are more limited than normal inspections for certification, the scope of the inspections being defined by the agreement under which they are conducted.

Each time a commercial fishing vessel is selected by the NMFS for award of charter, the Service will notify Commandant (G-MVI) regarding the name of the vessel, the location of the vessel at the time of charter, and the duration of the charter. Upon receipt of this information, Commandant (G-MVI) will notify the appropriate OCMI so that an inspection of the vessel may be made. Inspections under this agreement shall not be made by the cognizant OCMI until notification is received from the Commandant as noted above.

30-12-40B. INSPECTION STANDARDS

Vessels shall be in compliance with the regulations in 46 CFR Parts 24–26 (Subchapter C – Uninspected Vessels) with the *exception* of those portions relating to the carriage of passengers for hire (not applicable); the requirements for lifesaving equipment (see 46 CFR 25.25); and the requirements for fire extinguishing equipment (see 46 CFR 25.30). In lieu of complying with the lifesaving and fire extinguishing equipment requirements normally applicable to uninspected vessels, these vessels shall comply with 46 CFR Parts 180 and 181 (Subchapter T) as may be applicable depending on the vessel's length (S or L), and the intended operating route of the vessel while under charter.

30-12-40C. SEAWORTHY STANDARDS

The National Marine Fisheries Service will make a careful selection of the vessels they intend to charter to insure that they are basically seaworthy. The Coast Guard inspection is not considered an inspection for seaworthiness; however, a cursory examination of the vessel structure shall be made. If any manifestly unsafe structural conditions are observed, this fact shall be reported to Commandant (G-MVI) and a Letter of Inspection will not be issued. In the event that the Letter of Inspection is not issued due to unsafe structural conditions, the NMFS will normally cancel the pending charter and will charter another vessel.

30-12-40D. LETTERS OF INSPECTION

Vessels inspected and found in compliance with the applicable regulations shall be issued a Letter of Inspection by the cognizant OCMI. Letters of Inspection shall be issued in the form shown on plate 30-12-40D.1. The original Letter of Inspection shall be posted aboard the vessel, a copy shall be maintained by the local OCMI, and two copies shall be submitted to Commandant (G-MVI).

30-12-45. VESSELS CHARTERED BY THE INTERNATIONAL HALIBUT COMMISSION

Commercial fishing vessels which are chartered by the International Halibut Commission shall be inspected in the same manner described for vessels which are chartered by the National Marine Fisheries Service and shall be issued a Letter of Inspection in the form shown on plate 30-12-40D.1. See 30-12-40.

30-12-50. INSPECTION OF BOILERS ONLY, OR PRESSURE VESSELS ONLY, ON FLOATING EQUIPMENT

30-12-50A. APPLICATION FOR INSPECTION

Application for the inspection of boilers only, and/or pressure vessels only, on Government-owned floating equipment, shall be made to the OCMI in whose zone the inspection is to be conducted.

30-12-50B. INSPECTION REPORTS

All reports concerning such inspections shall normally be made on the form(s) supplied by the agency having custody of the equipment and shall be filed by the OCMI. A signed copy of the report showing the marine inspector's findings shall be submitted to the representative of the Government agency involved, in each case.

TABLE 30-12-20D(4).1

LIFESAVING EQUIPMENT FOR OCEANGOING MSC VESSELS

Item	Approved by	MSC vessels	Regularly inspected vessels
Passenger vessels			
Lifeboats	CG	50% (minimum)	100%
Life floats	CG or USN	Sufficient to total 150% when added to percentage accommodated in lifeboats	0
Buoyant apparatus	CG	0	25%
Life preservers S/B (adult)	CG or USN	100%	100%
Life preservers S/B (children)	CG or USN[1]	10%	10%
Freight vessels			
Lifeboats	CG[2]	200%	200%
Life preservers S/B (adult)	CG or USN	100%	100%

[1] In the case of austerity transports in which troops and troop officers are the sole passengers, 10 percent children's life preservers will not be required. However, 50 such life preservers shall be carried on each such vessel for emergency purposes.

[2] If vessel meets requirements for one compartment subdivision and damage stability in accordance with 46 CFR Part 73 and 46 CFR Part 74, lifeboats for only 100% will be required.

Plate 30-12-40D.1

SAMPLE
LETTER OF INSPECTION FOR CHARTERED COMMERCIAL FISHING VESSELS

This letter expires on (Expiration date of charter)

The ___(Vessel name)_____, ____(O.N.)____, was inspected by the Coast Guard on ___(date)____, at _____(place)_____ and was found to be in compliance with the applicable inspection criteria approved jointly by the Bureau of Commercial Fisheries and U.S. Coast Guard.

This vessel is considered satisfactory for operation during the period of charter on ____(route)____.

It is understood that a maximum of _______ crew and _______ persons in addition to the crew will be carried. Total persons allowed ________.

Primary Lifesaving Equipment Data	Portable and Fixed Fire Extinguisher Data
____________________________	__________________________
____________________________	__________________________
____________________________	__________________________
____________________________	__________________________

____
Officer in Charge, Marine Inspection

____
Inspection Zone

PART 30–13—MISCELLANEOUS VESSEL INSPECTIONS

30–13–1. GENERAL

This part of the manual includes instructions on those miscellaneous vessel inspections, other than reinspections and drydockings, which are related to, but do not necessarily occur at the same time as the inspection for certification.

30–13–5. PERMITS TO PROCEED

30–13–5A. AUTHORITY

The statutory authority for the issuance of a Permit to Proceed to Another Port for Repairs (form CG-948) is in 46 U.S.C. 435 which states in part that. . . when it can be done safely, repairs may be permitted to be made where those interested can most conveniently do them. . . .

The regulations applicable to the issuance of these permits are as follows:

- Tank Vessels - 46 CFR 31.10–35
- Passenger Vessels - 46 CFR 71.05
- Cargo and Miscellaneous Vessels - 46 CFR 91.05
- Public Nautical Schoolships - 46 CFR 167.30–5
- Procedures Applicable to the Public - 46 CFR 2.01–15
- Oceanographic Vessels - 46 CFR 189.05

30–13–5B. USE OF PERMIT TO PROCEED

Upon request of the owner or operator, the OCMI may issue a Permit to Proceed to Another Port for Repairs (form CG-948) to a vessel under certain conditions. This permit is a substitute for the Certificate of Inspection. The purpose of this permit is to allow the vessel to proceed to where repairs can be most conveniently accomplished. However, the statutes and the regulations provide that such permits shall be issued only when, in the judgment of the OCMI, the vessel may proceed to the designated port safely. Form CG-948 shall be used by the OCMI whenever granting such requests. In every case where a permit is issued, the OCMI shall withdraw the Certificate of Inspection (whether current or expired), together with all amendments thereto, and forward them with a letter containing particulars to the OCMI at the port to which the vessel is to proceed under the permit. A permit shall not be issued to a vessel which is otherwise eligible to retain its Certificate of Inspection or in any case where an amendment to the Certificate of Inspection will suffice.

It should be understood that a Permit to Proceed to Another Port for Repairs allows a vessel to be sailed from one port to another, touching at intermediate ports in her course. A permit shall not be issued to allow a vessel to go to several ports and return to the originating port, nor shall it be issued to permit a vessel to proceed from a port in the continental United States to a port outside the continental limits and return. If a vessel's Certificate of Inspection has expired or is about to expire, the OCMI may, at his discretion, issue a Permit to Proceed to the port of final discharge, provided an inspection for certification is started and progresses to a point where the OCMI considers it safe for the vessel to proceed and/or load cargo. Such an inspection for certification may be continued at other ports, and completed at the final port of discharge.

Every Permit to Proceed should be so worded that it will expire when the vessel reaches a designated port. In addition, information regarding the purpose for making the voyage, the nature and extent of the repairs necessary, special conditions to be observed during the voyage, modification in crew or equipment requirements, and whether or not the vessel shall be allowed to carry passengers and/or cargo, shall be clearly set forth in the permit. A Permit to Proceed may be renewed or extended by any OCMI having jurisdiction. It cannot be extended, however, to permit the vessel to return to the originating port or to go to a foreign port.

30–13–5C. INSPECTION FOR A PERMIT TO PROCEED

The issuance of a Permit to Proceed shall be contingent upon an inspection by a Coast Guard inspector to determine whether the proposed voyage can be accomplished safely. The scope and the extent of the inspection shall vary according to the circumstances and shall be determined by the OCMI.

30–13–5D. SMALL PASSENGER VESSELS PROCEEDING FOR REPAIRS

When not carrying passengers, small passenger vessels which are inspected under 46 CFR Subchapter T may proceed to another port for repairs without obtaining a Permit to Proceed (form CG-948). This is allowed because they are not subject to the provisions of the Certificate of Inspection when they are not carrying passengers.

30–13–10. SANITARY INSPECTIONS

30–13–10A. AUTHORITY

The statutory authority and requirement for sanitary inspections of vessels is in 46 U.S.C. 660a. The regulations establishing requirements for sanitary inspections are as follows:

- Passenger Vessels - 46 CFR 71.45
- Cargo & Miscellaneous Vessels - 46 CFR 91.35
- Tank Vessels – 46 CFR 31.10–45 and 46 CFR 35.01–5
- Small Passenger Vessels – 46 CFR 176.25–45
- Civilian Nautical School Vessels – 46 CFR 168.15–60
- Oceanographic Vessels – 46 CFR 189.33

30–13–10B. SCOPE OF INSPECTION ACTIVITY

The Coast Guard activity with respect to the supervision or control of vessel sanitation is basically divided into the following two areas:

(1) Design, construction, and arrangement of tanks, crew quarters, galleys, etc. This begins with plan approval prior to construction, alteration, or conversion, and includes matters of space, ventilation, plumbing, lighting, heating, control and location of overboard discharges, venting of fresh water tanks, installation of hot and cold water in hospital spaces, provisions against fresh water piping running through oil tanks because of possible contamination, installation of proper drains in waste disposal systems as well as in low points in piping systems, and the installation of insect screens and similar items (where required).

(2) Sanitary inspections. This inspection shall be held during each inspection for certification, reinspection, drydocking, and at such other times as provided for in the applicable laws and regulations. Inspectors shall be alert to detect and require correction of unsanitary conditions at all inspections.

Sanitary inspections shall be sufficient to satisfy the inspector that the crew's quarters are of the size required, that they are properly ventilated and in a clean and sanitary condition, that they are equipped with the proper plumbing and mechanical appliances required by law and regulation, and that the mechanical appliances, plumbing, etc., are in good working order. All crew accommodations including quarters, washrooms, messrooms, galleys, and storerooms shall be examined for sanitary conditions. Shipping commissioners and deputy shipping commissioners, when visiting vessels to supervise the shipment or discharge of crewmembers, shall inspect the sanitary conditions of crews quarters and report them to the OCMI.

30–13–10C. FREQUENCY OF INSPECTIONS

Sanitation on inspected vessels is, in general, considered to be the responsibility of the master and chief engineer. Coast Guard inspection personnel should restrict the number of sanitary inspections to the minimum compatible with the requirements of law and regulations. Sanitary inspections on small passenger vessels shall be held as the OCMI deems necessary, but normally shall be limited to inspections at the time of inspection for certification or reinspection.

▼30-13-10D. *U.S. PUBLIC HEALTH SERVICE*

The Public Health Service (USPHS), U.S. Department of Health, Education, and Welfare, also has statutory responsibility for U.S. vessel sanitation under 42 U.S.C. 264 and 271. The regulations and guidelines for this purpose are as follows:

- 21 CFR 1240 through 1250.
- PHS/FDA publication 293 – Handbook on Sanitation of Vessels Under Construction.
- PSH/FDA Publication 68 – Handbook on Sanitation of Vessels in Operation.

During construction, vessel plans are reviewed and, if the vessel is satisfactory upon completion, a "Certificate of Sanitary Construction" is issued to the vessel. Vessels in operation are boarded and examined by the USPHS at random intervals for sanitation examinations. If conditions are found to be satisfactory, the "Sanitary Certificate" is renewed. Coast Guard personnel should cooperate with USPHS personnel to the maximum extent possible, commensurate with workload and personnel availability.

30-13-15. EMERGENCY DRILLS

30-13-15A. GENERAL

Emergency drills are to be held in the presence of a Coast Guard inspector at each inspection for certification and reinspection. When drills cannot be conducted due to adverse weather or other uncontrollable factors, a form CG-835 may be issued granting the vessel a reasonable amount of time in which to conduct the drills in the presence of a Coast Guard inspector. The emergency drills shall be carried out in as realistic a manner as possible. There shall be no forewarning of the crew to the extent that fire hoses are led out, pumps started, and life preservers donned prior to the sounding of the general alarm. Spot checks of crewmembers shall be made to determine if the vessel's personnel know the various duties contained in the vessel's station bill. See chapter 32 for special instructions regarding fire and boat drills on foreign passenger vessels, and NVC 3-72 for training in the use of portable radio apparatus.

It cannot be overemphasized that a Coast Guard inspector does not conduct drills. His duty is to observe all drills and note deficiencies. General safety requirements are not always defined in laws and regulations. Hence, it is incumbent upon an inspector to employ common sense and sound judgment in the correction of deficiencies.

30-13-15B. FIRE DRILLS

During the course of the fire drill, the Coast Guard inspector shall require demonstrations to ascertain that the responsible personnel are familiar with the use of fire extinguishers, fixed carbon dioxide systems, fixed foam systems, sprinkling systems, hoses and nozzles, steam smothering systems, and all other emergency equipment. The inspector shall observe and insure that instructions in the use of such equipment are conveyed to the crew as necessary. The ship's officers should give the necessary instructions for the drill.

30-13-15C. LIFEBOAT DRILLS

Whenever lifeboat drills are conducted, care shall be exercised so that the hazards associated with the loading and unloading of a boat are kept to a minimum. Numerous casualties have occurred during lifeboat drills because adequate safety precautions had not been taken or because people took unnecessary chances. When possible, all lifeboats shall be lowered to the water. The crews of vessels which are equipped with oar-propelled lifeboats shall be exercised at rowing. Whenever a lifeboat is being raised it should be stopped when level with the rail or at some distance from the final stowed position, and all persons in the lifeboat should be required to disembark. The inspector should observe the boat drills but the necessary instructions for the drill should be given by the ship's officers.

30-13-15D. UNSATISFACTORY DRILLS

When a fire drill or a boat drill is considered unsatisfactory to the Coast Guard inspector, he shall report the matter to the OCMI. The drill should be repeated at reasonable periods until a satisfactory drill is attained. The OCMI shall consider unsatisfactory emergency fire and boat drills as justification for the withdrawal or withholding of the Certificate of Inspection.

30-13-15E. TIME OF HOLDING DRILLS

The sentence in 46 CFR 97.15-35(a), which requires a fire and boat drill within 24 hours of leaving port, is intended to mean that when the change of 25% of the crew necessitates it, a fire and boat drill shall be held with the entire crew aboard, either in port or after leaving port, within 24 hours either side.

30-13-20. TRAVELING INSPECTORS

Whenever such action is indicated, Commandant (G-M) may detail a member of his traveling inspector staff (Commandant (G-MT)) to perform certain inspections in the field. Before proceeding with such inspections, the traveling inspector will inform the district commander and the OCMI in whose jurisdiction the inspections will be performed, of his presence and purpose. As conditions permit, OCMI's shall assign inspection personnel to accompany the traveling inspector for training and observation.

Vessel inspections, as performed by traveling inspectors, differ in some respects from the customary scheduled inspections. With the exception of large seagoing passenger vessels which are inspected underway, Commandant (G-MT) inspections are generally unannounced, unscheduled, and conducted while underway whenever possible. Particular attention is directed toward the safe operation of a vessel and the quality of the emergency drills. Traveling inspectors may also perform other phases of field marine safety inspections according to the circumstances.

Traveling inspectors do not have the authority to issue requirements for the correction of deficiencies. If accompanied by an inspector from a local office, the local inspector may issue requirements, and in such instances the OCMI shall inform Commandant (G-MT) when the deficiencies have been corrected. If unaccompanied by an inspector from a local office, the traveling inspector will submit a report of deficiencies directly to Commandant (G-MVI). The OCMI will be informed of the results of the inspection, and he will be directed to inform Commandant (G-MVI) when the deficiencies have been corrected.

▼30-13-25. SPECIAL EXAMINATIONS OF UNINSPECTED VESSELS

▼30-13-25A. SAFE TO CARRY DRY AND PERISHABLE CARGO

A special examination of an uninspected vessel may be required in connection with an application to register certain foreign-built seagoing vessels. The provisions of 46 U.S.C. 11 and 46 CFR 67.63 require that before such vessels may be registered they shall have been certified as safe to carry dry and perishable cargo by an OCMI.

Some examinations may be necessary at outlying and remote areas within an OCMI's inspection zone, but in close proximity to other Coast Guard units with qualified boarding officers attached. The employment of these officers would clearly be in the best interests of the service.

When requested by the OCMI, and approved by the unit's commanding officer, group commander, or district commander (as appropriate), properly indoctrinated and qualified boarding officers (third class petty officer or above) may be designated to perform these examinations.

The persons so designated shall be thoroughly indoctrinated by the OCMI as to the purpose and scope of the examination, and the form of reporting the results to the OCMI via the unit commanding officer. Practical examinations in company with a marine inspector should be included in the training/qualification process.

▼30-13-25B. *LAID-UP, DISMANTLED, AND OUT-OF-COMMISSION VESSELS*

The provisions of 46 U.S.C. 391(e) provide that vessels subject to inspection under title 52 of the Revised Statutes, or acts amendatory or supplementary thereto, while laid-up, dismantled, and out-of-commission (no cargo, no passengers, gas freed, etc.), may be exempted by regulation from any or all inspections required. The provisions in 46 CFR 31.01-1, 70.05-1(a)(2), and 90.05- 1(a)(3) provide that tank vessels, passenger vessels, and cargo and miscellaneous vessels need not be in possession of a Certificate of Inspection if laid-up, dismantled, and out-of-commission. In order that such a vessel may be documented, have mortgages recorded, etc., without the vessel having a Certificate of Inspection for documentation purposes only, a letter may be issued over the signature of the OCMI to the effect that a vessel ordinarily subject to inspection is not required to be in possession of a Certificate of Inspection by virtue of the fact that the vessel is laid-up, dismantled, and out-of-commission as provided in the regulations.

30-13-25C. COURTESY EXAMINATIONS

(To be developed.)

PART 30-14—TESTS AND INSPECTIONS OF INERT GAS SYSTEMS

▼30-14-1. INTRODUCTION

As a result of the International Conference on Tanker Safety and Pollution Prevention held in London in February 1978 and President Carter's signing into law of the Port and Tanker Safety Act of 1978, increasing numbers of both U.S. and foreign flag tankships will be fitted with crude oil washing systems and inert gas systems which will be operating while the ships are in U.S. ports.

Because of the aforementioned mandates to install these systems on a great number of tankships, the need for providing guidelines on the operation, inspection, and testing of inert gas systems to marine safety personnel has become critical.

The purpose of this part of the manual is to provide marine safety personnel with a working knowledge of the general operation of inert gas systems, guidelines for conducting tests and inspections of inert gas systems, and personal safety precautions to be observed while conducting the tests and inspections on both U.S. and foreign flag tankships.

▼30-14-5. GENERAL SYSTEM DESCRIPTION

There are numerous inert gas (IG) plant designs on both U.S. and foreign flag tankers as well as different methods of introducing inert gas into the cargo tanks and venting displaced gases from those tanks. The inert gas may be treated flue gas from the main or auxiliary boiler(s) or from a separate inert gas generator. Prior to treatment by the scrubber, the primary difference between flue gas and generator-produced gas is that the sulphur dioxide content of the generator-produced gas is considerably lower, *provided* sulphur-free fuel is supplied to the inert gas generator.

Regardless of the differences between the various manufacturers' designs, the principles of operation, components, and general design features are similar, and a general working knowledge of inert gas systems may be easily developed. Prior to conducting an inspection or examination of a specific inert gas system, this general working knowledge *must* be expanded by reviewing the manufacturer's instruction manual and the ship's detailed operating procedures for the installed inert gas system. The purpose of the general information in this part of the manual is to familiarize Coast Guard marine safety personnel with:

(1) Typical inert gas system components and their functions;
(2) System operation;
(3) Areas and components to be internally inspected to detect system deterioration;
(4) Operational tests and inspections of components, safety devices, and alarms; and
(5) Personal safety precautions to be observed during inspections and tests.

▼30-14-10. DESCRIPTION OF TYPICAL SYSTEM COMPONENTS

(1) Boiler Uptake Valve ("Flue Gas Isolating Valve"). These are one or more remotely controlled butterfly valves which are fitted close to the main boiler uptake to isolate the inert gas scrubber from the boiler uptake. Associated with each boiler uptake valve is a steam soot-blowing system. A spectacle blank is also fitted between the boiler uptake valve and the IG scrubber to insure isolation of the IG plant during maintenance periods and detailed inspections.

(2) Inert Gas Scrubber ("Scrubbing Tower," "Absorption Tower," or "Gas Washer"). This cools the flue gas and removes most of the sulphur dioxide and particulate soot by the use of large quantities of sea water in direct contact with the flue gas. It also acts as an additional safety device (by the existence of a water seal) to prevent any back flow of gas to the boiler uptake. (See figure 1, plate 30–14–10.1.)

(3) Demister Units. These are located either on top of the IG scrubber or adjacent to it, and they remove entrained water from the inert gas mixture. The units may consist of "pads" or "mattresses" of woven polypropylene or fiberglass, or centrifuge separation (cyclone dryers). Individual manufacturer designs vary considerably.

(4) Inert Gas Blowers ("Fan Units"). Two centrifugal blowers are fitted in the vicinity of the scrubber to draw the inert gas mixture from the scrubber/demister unit and deliver it to the IG distribution system at the required pressure. When fitted together, the blowers must be capable of delivering at least 125% of the maximum rated capacity of the cargo pumps. Separate inlet and discharge butterfly valves are fitted to each blower unit. On most plants, the valves are hand-operated; however, on some plants, the discharge valves are combined with the main and auxiliary pressure-regulating valves.

(5) Pressure Regulating Valve ("Gas Regulating Valve", "IG Control Valve", or "Main Valve"). This is a remote controlled, variable position, butterfly valve which serves to regulate the flow of inert gas to the IG deck main and to automatically prevent any backflow of gas when the plant either trips through a malfunction or is secured normally. The position of the valve may be controlled manually or automatically. In the latter case, a "feedback" of IG deck pressure is used to control the valve so that a constant pressure can be maintained regardless of the rate of discharge of cargo, etc.

(6) Deck Water Seal. Located on the main deck, this is the primary cargo gas barrier and the principle safeguard to prevent any reverse flow of hydrocarbon gas from the cargo tank system to the machinery space. The deck water seal offers a positive break in the system by means of a water trap which permits inert gas to be delivered to the deck main but prevents any back flow or cargo gas even when the IG plant is shut down. It is vital that a supply of water be maintained to the seal at *all* times. Two independent water supplies are fitted to the deck water seal. When the plant is operating, the scrubber pump supply is used; however, a secondary, independent supply (normally the salt water service pump) must be continuously available when the plant is shut down. A demister is fitted in the wet type seal and a venturi or drop tank arrangement is incorporated in the dry type seal so that water droplets are not entrained in the gas and carried into the cargo tanks. (See figures 2 through 4 on plate 30–14–10.1.)

(7) Deck Mechanical Non-Return Valve. As a further precaution to prevent back flow of gas or liquid from the cargo tanks, one or two mechanical non-return valves are fitted on the cargo tank side and in series with the deck water seal.

(8) Deck Isolating Valve ("Main Isolating Valve"). This is used to isolate the IG plant from the deck distribution system and the cargo tanks. It is therefore the "first" barrier to any reverse flow of cargo tank gas when the IG plant is being lit off, tested, or secured.

(9) Inert Gas Distribution System. This consists of a single IG main running the entire length of the cargo deck, starting at the deck isolating valve aft and ending at the pressure release valve forward. From the IG main, individual branch lines run to each cargo tank. The IG main is normally common to all tanks, with the exception of the slop tanks. The preferred means of isolating individual tanks is by inserting special spectacle or long/short handled spade blanks in each branch line; however, some older installations are still fitted with branch line isolation valves rather than blanks.

(10) Typical Gas Venting Arrangements:

(a) A single common venting system using the IG deck main and IG branch lines from each tank and venting to atmosphere through one or more mast risers or through several high velocity vents.

(b) A common venting system using a separate vent main and vent lines from each tank with the system venting to atmosphere through one or more mast risers or through several high velocity vents.

(c) Individual vents on each cargo tank using either standpipes (vent stacks) or high velocity vents.

(11) Forward Pressure Release Valve ("By-Pass Valve"). This is installed in parallel with the pressure/vacuum valve and is a remotely operated butterfly valve which is kept closed, except when releasing tank gas during loading or ballasting or when depressurizing the cargo tank system.

(12) Pressure/Vacuum Valve. Deadweight mechanical P/V valves are fitted to enable the tank system to release excess pressure caused by large variations in ullage space or cargo temperatures (cargo tank breathing).

(13) Pressure/Vacuum Breaker ("Oil Water Breaker" or "Oil Seal"). One or more liquid-filled P/V breakers are fitted in the inert gas main to prevent excessive pressure or vacuum from causing structural damage to cargo tanks in case of:

(a) IG blower failure during discharge at maximum rate;
(b) Failure or incorrect setting of P/V valve(s); or
(c) Failure to open forward pressure release valve (or, if fitted, high velocity vent covers) during loading or ballasting.

These devices require little maintenance but will only operate at the required pressure if properly filled with liquid of the correct density. A suitable oil or a freshwater-glycol mixture is used to avoid freezing in cold weather. (See figure 5 on plate 30-14-10.1.)

(14) Slop Tank Arrangement. To enable interface readings to be taken without de-pressurizing the whole ship, the IG branch lines to the slop tanks are fitted with individual isolating valves. Individual P/V valves are provided to protect the tank structure when an isolating valve is closed.

(15) IG Line Blanks ("Spade Blank" or "Spectacle Blank"). Arrangements for fitting blanks are provided near the end of each IG branch line. Spade blanks are used when the branch line enters through a hatch, and spectacle blanks are used when the line passes through the deck. These blanks are solely for use when gas-freeing individual tanks. When in position they remove the protection of the P/V valve and P/V breaker arrangements; thus, where possible, long-handled spade blanks are provided to prevent the closing of ullage covers while the blanks are in position.

▼30-14-15. BASIC DESCRIPTION OF GAS FLOW THROUGH A TYPICAL IG SYSTEM

(Refer to plate 30-14-15.1.)
Gas is provided either from the main propulsion or auxiliary boiler uptake point or from the inert gas generator through the flue gas isolating valve or IG generator isolating valve to the IG scrubber. Before entering the bottom of the "scrubbing tower," the gas is cooled by being passed either through a water spray or bubbled through a water seal.

In the scrubbing tower itself, the gas moves upwards through a plentiful supply of downward flowing seawater. For maximum contact between gas and water, several layers made up of one or more of the following arrangements may be fitted:

(1) Spray nozzles;
(2) Trays of "packed" stones or plastic chippings;
(3) Perforated "impingement" plates; and
(4) Venturi nozzles and slots.

Sea water is supplied to the scrubber by an independent, continuously rated "scubber pump." The salt water service pump is normally piped into the system to provide a secondary or backup supply of salt water.

The scrubber effluent ("wash" or "cooling water") is acidic (ph value of 2 to 4), and special corrosion-resistant piping must be used to discharge it overboard. A vacuum breaker (u bend) is necessary to prevent possible loss of water in the seal. It is vital to recognize that the scrubber efficiency depends upon an adequate salt water supply for a prescribed gas flow. Fresh water flushing facilities are provided so that all acidic solution may be removed from the scrubber after the IG plant is shut down.

At the top of the "scrubbing tower," water droplets are removed from the "inert" gas mixture by one or more demisters.

The operating blower(s) draws the inert gas mixture from the scrubber/demister unit under vacuum and delivers it to the IG distribution system at a rate of up to 125% of the maximum capacity of the cargo pumps. The blowers may be either steam turbine or electric powered via a flexible coupling. Steam inlet and return valves are manually operated, but both blowers can be controlled from the engine control room. To prevent the blowers from overheating when there is no demand for inert gas in the cargo tanks, a recirculating line is fitted to return the blower discharge to the scrubber. The re-circulation flow is controlled by "re-circulating" or "by-pass" valves operated either independently by gas flow demand or in conjunction with the gas pressure regulating system.

Some IG blowers are used for gas-freeing the cargo tanks as an alternative to portable blowers or a separate fixed gas-freeing blower system. In this event, the necessary arrangements are fitted to isolate the flue gas and substitute suction from atmosphere. As with the scrubber, fresh water flushing facilities are fitted to remove acidic accumulations in the blower casings.

The inert gas mixture then passes through the pressure regulating valve, the deck water seal, the deck machanical non-return valve(s), the deck isolating valve, into the IG main, into individual branch lines, and into the cargo tanks.

▼30–14–20. CONDUCTING INTERNAL INSPECTIONS OF INERT GAS SYSTEMS

▼*30–14–20A. GENERAL GUIDELINES*

The potential for introducing "dirty, corrosive" gas into the IG distribution system by improper operating procedures or poor maintenance practices, thus creating an atmosphere for rapid system deterioration and/or component failure, must be recognized and appreciated by each Coast Guard marine inspector.

The following specific guidelines have been developed to disseminate information on common problem areas which have been found in inert gas systems as a result of corrosion, deterioration, scale buildup, soot accumulations, or component failure.

It is not intended that the areas discussed would normally be inspected during routine operational safety tests of the inert gas system on either a U.S. or a foreign flag tanker. It is anticipated that the Coast Guard will normally inspect these areas only on U.S. flag tankers during required drydock examinations and/or biennial inspections for certification. The biennial inspection requirement is considered minimal as many manufacturers' instruction manuals recommend that owners conduct inspections of various components of the system on an annual and, in some cases, a semi-annual basis. Regulations requiring a biennial inspection of inert gas systems on U.S. flag tankers will be contained in 46 CFR 61.20.

Guidelines for conducting routine operational safety tests of inert gas systems on U.S. and foreign flag tankers are addressed in subpart 30–14–25 below.

▼30-14-20B. SPECIFIC INSPECTION GUIDELINES

(1) Scrubber. Require removal of all access plates and internal components (where feasible), such as demister pads and scrubber trays, to facilitate as detailed an internal inspection as possible. Require soot and scale deposits to be removed prior to commencing inspection. The following areas and internal components should be given close attention:

(a) Internal coatings should be totally intact. Check for signs of chipping and/or cracking, particularly around internal fastenings.

(b) Inspect gas inlet pipe in scrubber water seal for corrosion and/or holes or leaking flanges, especially above the water level, which would allow gas to bypass the seal and render it ineffective.

(c) Closely inspect the internal area at the bottom of the scrubber for corrosion, especially in way of the effluent discharge line. Check the discharge line for clogging.

(d) Inspect float switches, temperature sensors, venturi slots, impingement plates, packed trays, and demisters for damage, wastage, and corrosion to insure that all fastenings and mountings are intact and in good condition.

(e) Inspect both the fresh and salt water inlet piping for corrosion or wastage and especially for holes or leaking flanges. Check spray nozzles for clogging and intactness.

(2) Valves. Require boiler uptake valve(s), blower inlet and discharge valves, recirculating valve(s), pressure regulating valve(s), deck mechanical nonreturn valve(s), deck isolating valve, and slop tank isolating valve(s) to be disassembled for inspection. Inspect valve internals for signs of corrosion, erosion, and cleanliness. Careful attention should be given to "butterfly" mechanisms to insure free, smooth operation and proper seating. Check nonreturn valve seals. If accessible, either through inspection ports or disassembled components, check the internal areas of the IG main and branch lines for excessive scale buildup or soot deposits which could result in a critical gas pressure drop between the IG blowers and the cargo tanks.

(3) Flue Gas Bellows. Inspect flue gas bellows for corrosion, with special attention to those installed in a horizontal position. Require effluent discharge valve to be disassembled for inspection, and carefully check valve and spool piece for corrosion. If necessary, keeping in mind that special alloys, materials, and coatings are used, require ultrasonic testing of both the spool piece and the effluent line from the scrubber to the overboard discharge valve. In-service failure of the valve or overboard spool piece, in many installations, could result in engineroom flooding.

(4) Deck Water Seal. Require the disassembly of the deck water seal. Inspect internal coatings for intactness; inspect housing and heating coils for corrosion; inspect gas inlet pipe for corrosion and/or holes or leaking flanges especially above the water level which would allow gas to bypass the seal and render it ineffective; and inspect drain lines for clogging and corrosion. On the "wet type" of seal, insure demister pads are clean and free of soot and scale deposits. On the semi-dry type, insure the venturi pipe to the holding chamber is not clogged. On the dry type, insure that the automatically controlled valves and the float level control operate freely.

(5) Blowers. Require the inspection ports and access plates on both blowers to be opened, and inspect blower impellers and casings for corrosion or excessive buildup of deposits which could cause blade imbalance with resulting vibration and bearing failure. If accessible, inspect fresh water flushing spray nozzles for intactness and clogging and the blower drain piping for corrosion and clogging.

(6) P/V Valves. Require P/V valves to be disassembled and inspect for corrosion and the choking of flame screens from soot, oil entrainment, rust, etc. Require the forward pressure release valve to be disassembled and inspect "butterfly" mechanism to insure free, smooth operation and proper seating. If feasible, require the liquid-filled, pressure-vacuum breaker to be drained and inspect for sludge/soot/sediment buildup in the bottom which could render the component ineffective. If high velocity vents are installed, inspect for internal deposits which could reduce venting capacity.

(7) ***Flue Gas Uptakes.*** On "flue" gas systems, when the boilers are secured and if accessible, inspect the flue gas uptake for clogging from soot deposits. On inert gas generator systems, inspect the combustion chamber for soot, scale, or fuel deposits as evidence of improper combustion control or a distorted fuel spray pattern.

▼30–14–25. OPERATIONAL TESTS AND INSPECTIONS

▼30–14–25A. GENERAL

The following information has been developed to provide a general guide and reference for observing and conducting tests and inspections of an operational inert gas system on both U.S. and foreign flag tankers. These tests and inspections are to be conducted on U.S. flag tank vessels during biennial inspections, mid-period reinspections, and prior to allowing the vessel to crude oil wash in a U.S. port. They are to be conducted on a foreign flag tank vessel at each annual foreign tank vessel safety examination and prior to allowing the vessel to crude oil wash in a U.S. port.

The scope of both the tests and inspections must be sufficiently detailed to insure that the inert gas system, even if installed prior to mandatory requirements being instituted, is operating within the manufacturer's design parameters and that the installed safeguards would operate as intended in the event of a system malfunction. Inspectors are again reminded that the manufacturer's instruction manual and ship's detailed operating procedures *must* be reviewed prior to conducting tests and inspections of a specific inert gas system, being alert for those test conditions that must be simulated.

▼30–14–25B. OPERATIONAL INSPECTION PROCEDURES

(1) Externally inspect the condition of all piping and components for signs of gas leakage/effluent leakage.

(2) Observe both inert gas blowers while operating for excessive bearing noise or vibration. Insure that the scrubber room ventilation system is operating.

(3) Observe the operation of both the salt water scrubber pump and the pump utilized to provide an alternate salt water supply (if fitted).

(4) If the scrubber design utilizes a water seal (some are fitted with only water sprays), check for proper water level.

(5) Observe the deck water seal for automatic filling and draining, and check water level with local gauge if possible. Check for presence of water carry-over (especially in the wet and semidry types) by opening the drain cocks on the inert gas main during operation. Observe that the heater coil is operational.

(6) Check the operation of all remotely operated or automatically controlled valves and, in particular, the flue gas isolating valves(s).

(7) If possible, check the level and specific gravity of liquid in the pressure/vacuum breaker.

(8) Check to insure that all salt water supply pressure gauges, oxygen and gas pressure recorders, and temperature and pressure gauges are fully operational. The fixed inline oxygen analyzing equipment will have the feature of being calibrated during operation of the inert gas system. Observe a calibra-

tion check of the equipment by a qualified member of the ship's crew.

(9) Observe that all portable instruments are properly calibrated and operational as stipulated by the manufacturer's instruction manual. These may include an oxygen analyzer, combustion gas indicator, and hydrocarbon gas indicator. Sample points should be provided to facilitate the use of portable instruments for monitoring cargo tank atmospheres.

▼*30-14-25C. OPERATIONAL TESTS*

(1) The operation of both the audible and visual alarms should be observed in the cargo control room, the engine control room, and the pilot house. The manufacturer's instruction manual and the ship's detailed operating procedures are to be referenced continuously in determining proper test procedures. Simulation may be necessary for some tests; however, a "test" of the alarm panel should never be accepted as evidence of satisfactory operation of the following alarm and safety shutdown systems:

(a) High oxygen content of gas in IG main – alarms at 8%.

(b) Low gas pressure in IG main – alarms at 100 mm (4") w.g. Automatic shutdown of the cargo pumps may be fitted on some systems.

(c) A low water level alarm or low water flow pressure alarm will be fitted to the deck water seal which will automatically shut down the IG blowers.

(d) Low water flow pressure to scrubber – low or high water level alarms may also be fitted to the scrubber water seal. Low water flow pressure will automatically shut down the IG blowers.

(e) IG blower high discharge temperature alarm which will automatically shut down the IG blowers – alarms at 150°F (65.6°C).

(f) IG blower failure alarm.

(2) Conduct back flow pressure test of water seal and nonreturn valve.

(3) Test interlocking of soot blowers. The IG system will automatically shut down if soot blowers are operated.

(4) Test for automatic shutdown of the gas pressure regulating valve when the IG blowers are secured.

(5) Test the automatic combustion control features of the inert gas generator in accordance with standard combustion control test procedures for automatic auxiliary heating equipment (see 46 CFR part 63).

▼30-14-30. SAFETY PRECAUTIONS

It is obvious that the purpose of an IG system is to establish positive pressure on a cargo tank with an atmosphere that will not support combustion. It should therefore become obvious that such a pressurized atmosphere is inherently dangerous to human beings. The following basic safety guidelines are intended to provide marine safety personnel with an awareness of the fundamental steps that must be taken to insure personal safety:

(1) Become familiar with this manual and:

(a) The regulations in 46 CFR subpart 32.53;

(b) The ABS Rules and Regulations for Building and Classing Steel Vessels, Appendix B, Regulation 10;

(c) SOLAS 74, Chapter II-2, Part E, Regulation 62(j);

(d) The manufacturer's instruction manual; and

(e) The ship's detailed operating procedures.

(2) Always require a ship's officer or port engineer trained in the operation of the ship's IG system

to accompany you and to oversee all required operations and tests.

(3) Do not enter a cargo tank *under any circumstance* when the IG system is operating and/or adjacent tanks are inerted *unless* you require:

(a) Pressure on the remainder of the system to be lowered to 200 mm (8") w.g. to minimize the possibility of inert gas leakage into the "gas-free" cargo tank.

(b) The IG branch line spectacle or spade blank to that cargo tank to be in position with a man stationed at the ullage opening within clear view of the blank. He should be wearing a self-contained, pressure-demand breathing apparatus ready for immediate use and be provided with a rescue life line. (Note: if an isolation valve is fitted rather than a blank, require it to be wired closed, labeled "personnel in cargo tank," and with a man stationed as stipulated above.)

(c) Drain lines (if fitted) from the IG main to that cargo tank are to be secured.

(d) The relevant cargo line valve to be closed.

(e) The cargo tank to be certified "safe for men" by a certified marine chemist.

(f) That the cargo tank be continually vented and regularly tested with the fixed oxygen analyzer system.

(g) The wearing of an approved self-contained, pressure-demand breathing apparatus but do not activate unless needed and be equipped with a belt-mounted, calibrated portable oxygen/combustion gas indicator which is in continuous operation.

(4) If the inert gas system is secured and the IG blowers are being used to purge and ventilate the cargo tanks, the branch line spectacle or spade blanks must be left opened. In this case, insure that the spectacle blank downstream of the boiler uptake valve is in place and that a man is stationed at that blank.

(5) Always stand well clear of any ullage opening when the cover is being removed, even though the cargo tank pressure has been lowered to a "safe" limit.

(6) Never inspect the flue gas bellows or scrubber unless all branch line spade and spectacle blanks are in place (or branch line isolation valves are closed) and the spectacle blank downstream of the boiler uptake valve is in place, isolation valves are closed, and the IG system has been purged and certified "safe for men" by a certified marine chemist. If a boiler is operating, require a man to be stationed at the spectacle blank downstream of the boiler uptake valve.

(7) Wear protective goggles and protective clothing when conducting internal inspections of the system, and always be mindful of the potentially corrosive nature of the dirt, scale, and soot associated with the internals of an inert gas system.

(8) When conducting internal inspections of pumprooms, permanent ballast tanks, fuel oil tanks, cofferdams, etc., on tank vessels fitted with IG systems, be aware that inert gas may have leaked into those tanks or compartments. While inspecting the tank or compartment, be equipped with an emergency escape breathing apparatus and a belt-mounted, calibrated portable oxygen/combustion gas indicator which is in continuous operation. Always test for sufficient oxygen first (must contain at least 19.5%); then test for vapors above 10% of the lower flammable limit. A combustion gas indicator *will not* give an accurate indication of the percent of hydrocarbon gas in an oxygen-deficient atmosphere. A hydrocarbon gas content meter *must be used* to determine if hydrocarbon vapors are present in an accidentally or purposely inerted compartment or tank.

PLATE 30-14-10.1
TYPICAL IG SYSTEM COMPONENTS

FIGURE 1.

Illustration of a Typical Inert Gas Scrubber with Inlet Water Seal and Demister Pads

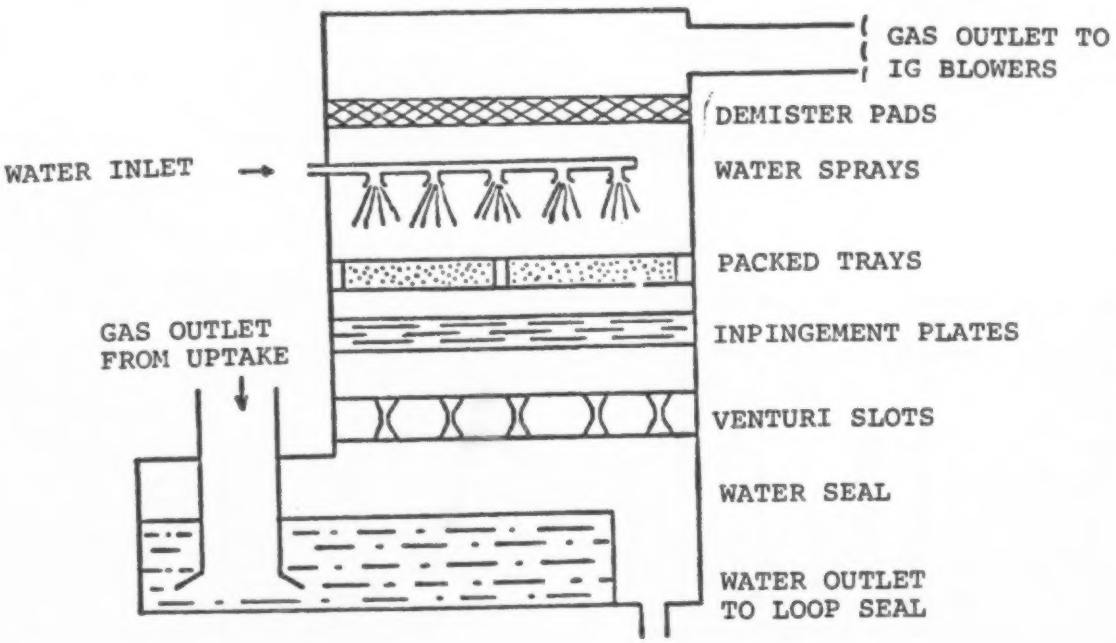
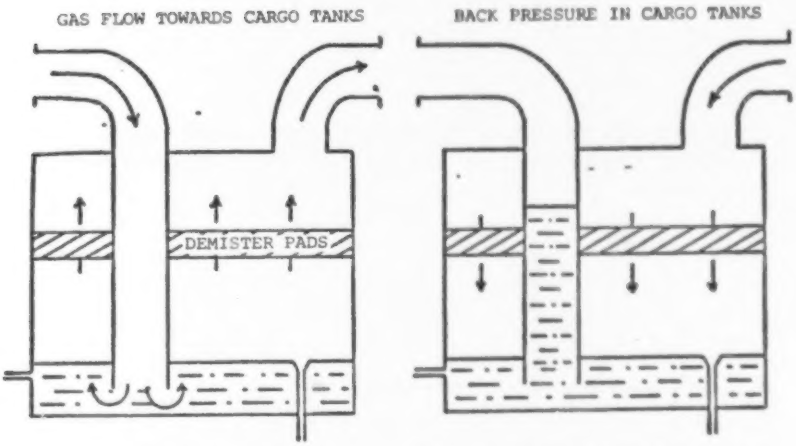


PLATE 30-14-10.1 (continued)

FIGURE 2

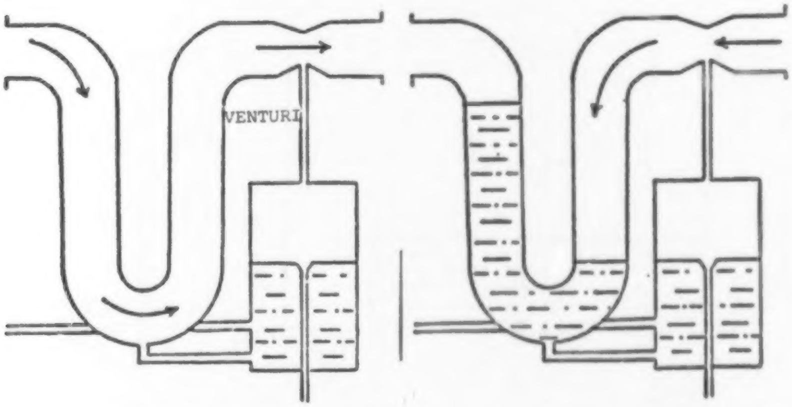
Deck Water Seal -- Wet Type



During normal IG plant operation, the gas bubbles through the water from the submerged inlet pipe. If the cargo tank pressure exceeds the IG inlet line pressure, the water is pressed back up into the inlet pipe preventing backflow.

FIGURE 3

Deck Water Seal -- Semi-Dry Type

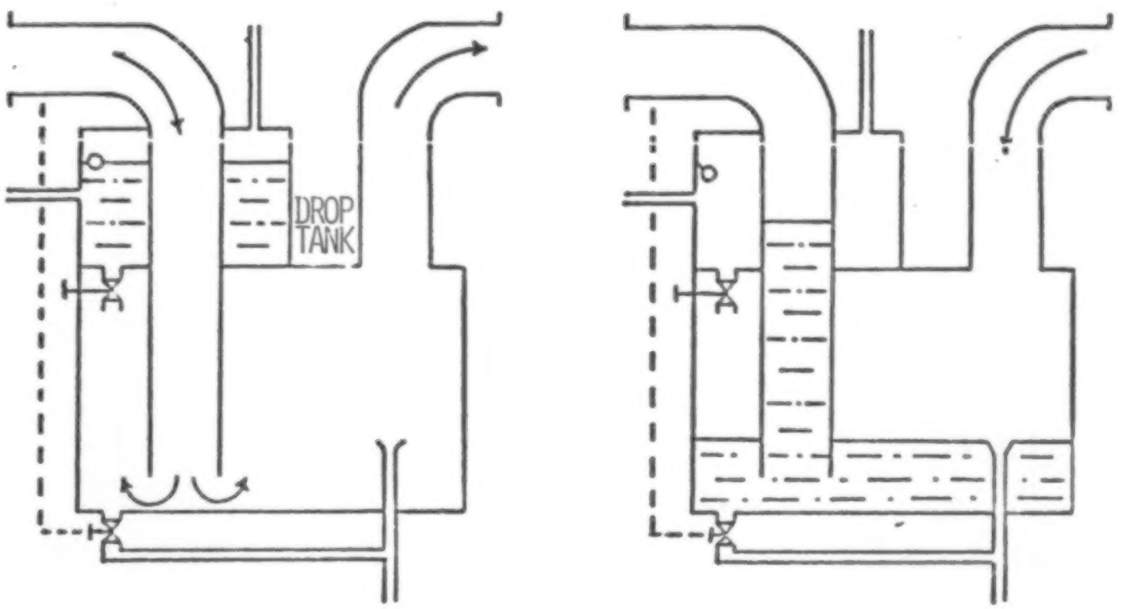


Instead of bubbling through the water trap, the inert gas flow draws the sealing water into a separate holding chamber by venturi action, thus eliminating the need for a demister. Otherwise, it functions the same as the wet type seal.

PLATE 30-14-10.1 (continued)

FIGURE 4.

Deck Water Seal - Dry Type



In the dry type seal, the water is drained from the seal when the IG plant is in operation (gas flowing to the tanks), and filled with water when the IG plant is either shut down or the tank pressure exceeds the IG blower discharge pressure. Filling and drainage are performed by automatically operated valves controlled by the levels in the water seal and the drop tank and by the operating state of the blowers.

PLATE 30-14-10.1 (continued)

FIGURE 5.

Liquid Filled P/V Breaker

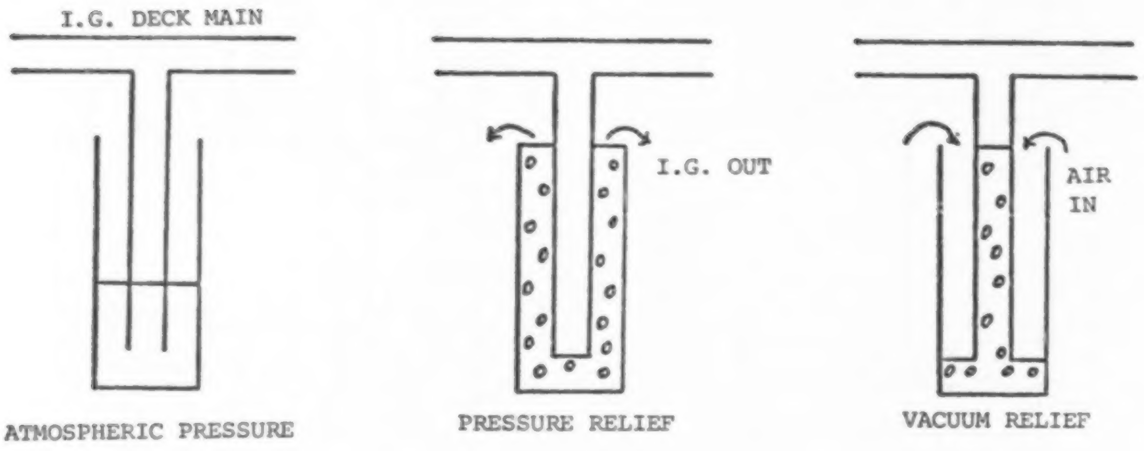
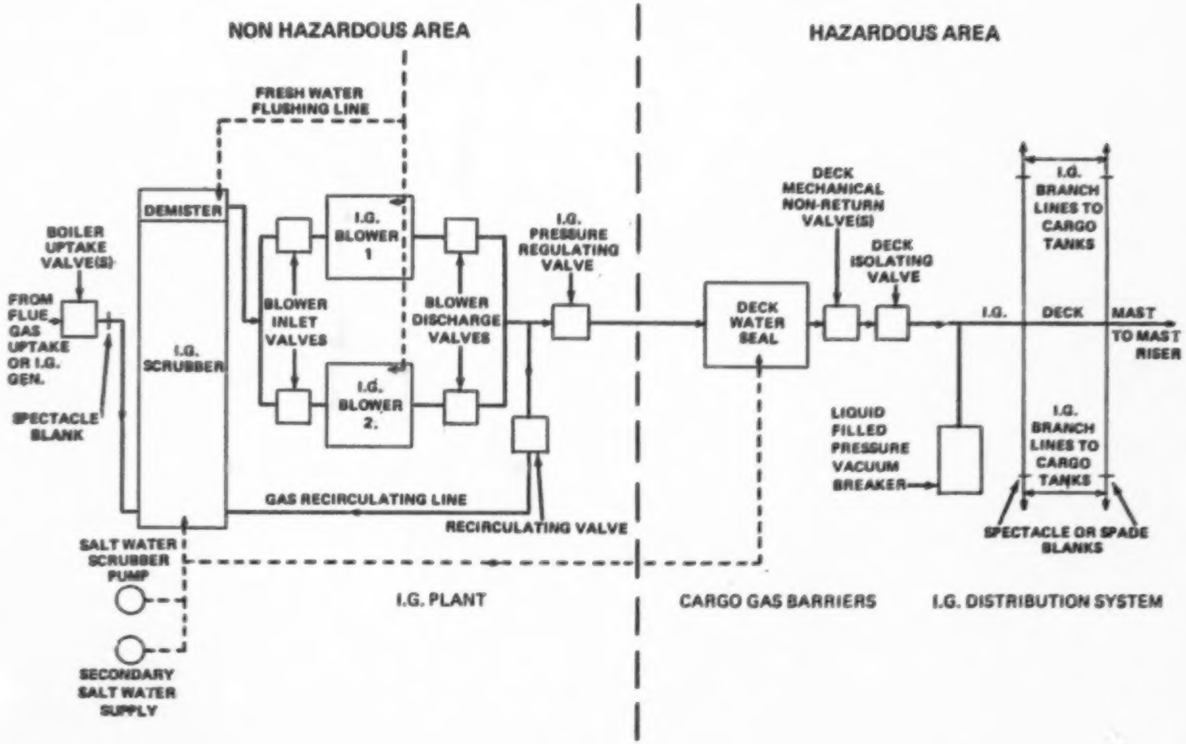


PLATE 30–14–15.1
TYPICAL INERT GAS SYSTEM ARRANGEMENT



CHAPTER 31 - INSPECTION OF EQUIPMENT AND MATERIALS

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PART 31-1--INSPECTION OF EQUIPMENT AND MATERIALS--GENERAL

31-1-1. INTRODUCTION

This chapter contains information governing the administration of special inspections of equipment and materials by Coast Guard marine safety personnel. It implements those provisions of Title 46, Code of Federal Regulations applicable to the inspection of equipment and materials at the manufacturer's plant or in a shipyard. This information has been formulated to facilitate uniform application of the laws and regulations relating primarily to the inspection of equipment and materials for use on inspected vessels, and to certain items of equipment (PFD's, etc.) on uninspected vessels.

31-1-5. RESPONSIBILITY OF THE COMMANDANT

The Commandant is required by certain laws and regulations to approve certain items of equipment and materials before they are installed or used on inspected merchant vessels, certain uninspected vessels, and boats (see 46 CFR, Subchapter Q). The Commandant's approvals of equipment and materials are published in the Federal Register as well as in Equipment Lists, COMDTINST M16714.3 (old CG-190).

Terminations of approval are also published in the Federal Register; Equipment Lists include a separate section containing a complete list of formerly approved instruments, machines, and equipment which may be continued in service as long as they are in good and serviceable condition, unless otherwise noted (see also section 31-3-10F concerning the equipment card index system).

31-1-10. RESPONSIBILITY OF THE MARINE INSPECTOR

The inspector is responsible for determining whether or not equipment and materials are manufactured in accordance with the standards required for the Commandant's approval. The inspector must also perform certain inspections when required by regulations. This responsibility is also imposed where the public has a reasonable expectation that certain equipment and materials, if approved by the Coast Guard, will, in an emergency, perform their intended use. Some laws also provide penalties for failure of lifesaving equipment to meet the requirements of the Commandant. See Laws Governing Marine Inspection (CG-227) for a reprinting of the laws dealing with vessel inspection and safety.

31-1-15. REPORTS OF UNSATISFACTORY EQUIPMENT

When a factory or shop inspection is made of equipment and materials required to be Coast Guard-approved, in which the inspector is not satisfied that the equipment or materials meet the requirements of the applicable specifications or regulations, a complete report shall be submitted to Commandant (G-MMT) via the chain of command. If unsatisfactory conditions are serious, the OCMI and district commander shall take immediate steps to suspend the approval, pending instructions from the Commandant (see 46 CFR 2.75-40).

Reports should also be initiated when vessel inspections indicate problems or potential problems associated with approved equipment and materials. While a system exists for reporting equipment failures, problems which are not sufficiently critical to require such a report, or which are of a type where the use of the report form is not appropriate, are often noted. In addition, a source of a problem may sometimes be a regulation or its interpretation, and items are not reported by an inspector because the few items encountered do not seem significant. However, if several inspectors are having similar experiences, further investigation may be warranted.

An inspector is encouraged to discuss even minor types of problems with his supervisors and other inspectors. Reports should be submitted via the chain of command which clearly identify the problem, give samples with pictures if possible, indicate impact, and include recommendations for correction. Proper feedback is essential if the regulations and inspection policies are to remain effective.

31-1-20. ACCEPTABLE EQUIPMENT AND MATERIALS

31-1-20A. GENERAL

Subparts 31-1-25 and 31-1-30 describe specification and approval requirements for equipment, materials, etc. In contrast to the procedures described in these subparts for equipment and materials which are required by regulation to be approved by the Commandant, certain other items of equipment and materials *may* be accepted by the Commandant for use on board inspected vessels, uninspected vessels, and boats after certain actions are taken for control purposes (such as the submission of an affidavit by the manufacturer that applicable regulations will be met). Unlike "approved" equipment and materials, "accepted" items are not normally published in the *Federal Register*. However, listings can be found in *Equipment Lists* and are published from time to time in the *Proceedings of the Marine Safety Council* (CG-129).

The types of equipment and materials which appear in this category are listed below, and the applicable parts of chapter I, Title 46 of the Code of Federal Regulations which describe the procedures for their acceptance are identified.

31-1-20B. MARINE ENGINEERING EQUIPMENT

Certain items of marine engineering equipment and materials, such as valves, fittings, and flanges, can be accepted by the Commandant on an affidavit basis if certain regulatory requirements are met (see section 31-3-5C).

31-1-20C. FILLER METALS

Foreign and domestic filler metals, including electrodes, wire-flux, and wire-gas combinations, must be tested and listed by the American Bureau of Shipping (ABS) in the latest edition of its publication *Approved Welding Electrodes, Wire-flux, and Wire-Gas Combinations*. In those cases where limited application may preclude such listing, acceptance by the Coast Guard will be based on a satisfactory procedure qualification by the fabricator.

46 CFR 57.03-1(e) limits the use of type E6012, E6013, E6014, E6024, E7014, and E7024 electrodes. Their use is permitted only when the welding procedure used with the specific electrode is qualified by the local Coast Guard inspector in accordance with the tests and procedures of 46 CFR 57 (Welding and Brazing). These electrodes may not be used on lifesaving equipment or on ship's hulls in any fabrication or repair involving butt welds in the shell, strength deck, tank top, strength bulkhead, or longitudinal strength member, nor on galvanized material unless the welding procedures used with the specific electrode of the manufacturer in question are qualified by the inspector in accordance with the procedures outlined in Section 30 of ABS's Rules For Building and Classing Steel Vessels. It should be noted that the use of E7024 rod is contingent upon periodic welding tests carried out to ensure that adequate weld quality is maintained. As a consequence, acceptable welding with E7024 rod cannot be determined on a once-only basis; frequent production tests during welding are required. Additionally, for lifesaving equipment, specific acceptance of a welding procedure shall be obtained from Commandant (G-MMT-3).

These electrodes may be used in hull construction for horizontal and flat fillet weld attachment of stiffening members provided the welding procedure used with the specific electrode of the manufacturer in question is qualified in accordance with the procedures outlined in Section 30, Part III of the ABS Rules. The inspector may require such workmanship tests as he deems necessary to determine that satisfactory welds are being produced.

31-1-20D. ELECTRICAL EQUIPMENT

Manufacturers of certain items of marine electrical equipment such as navigation light panels, cable transit devices, engine order telegraphs, general alarm equipment, etc., may submit plans and information on their equipment to Commandant (G-MMT) for consideration and acceptance prior to use on inspected vessels. If the plans of the equipment meet the requirements of the regulations, such equipment will be considered satisfactory for use on inspected vessels. For convenience, this equipment is listed in the Miscellaneous Electrical Equipment List (CG-293).

A second method that equipment manufacturers may use to obtain prior acceptance of their electrical equipment is through the Underwriters' Laboratory, Inc. (UL) Marine Listing Service. A UL "Marine Listing" or "Marine Listing For Use on Vessels Over 65 Feet" means that, in addition to meeting the specific UL standard, the equipment also meets the applicable requirements of 46 CFR 110-113 (Subchapter J - Electrical Engineering). This listing has resulted from the fact that UL has Marine Supplements to some of their electrical standards. These supplements contain specifications which meet the applicable requirements of 46 CFR 110-113. The equipment must also be marked "Dripproof", "Watertight" or "Suitable for Use in Corrosive Locations" if it is to be used in a location where the regulations require such an enclosure. It is important that the UL label state that the equipment has a "Marine Listing" or a "Marine Listing for Vessels over 65 Feet."

Electrical equipment neither listed in CG-293 nor having a UL "Marine Listing" may be approved by a field (mmt) office on an individual basis.

31-1-20E. SHIP'S STORES AND SUPPLIES

The regulations in 46 CFR 147 (Subchapter N - Dangerous Cargoes) require that certain items of ships' stores and supplies be tested and certificated by the Coast Guard before such items may be carried or used on inspected vessels.

31-1-25. SPECIFICATIONS FOR EQUIPMENT, MATERIALS, AND METHODS OF FABRICATION

During World War II, it was found that specifications for certain items of equipment required to be approved by the Commandant provided greater uniformity in the manufacturing thereof by various manufacturers. Certain items of equipment, which met neither the minimum standards nor the intent of the regulations, were more easily rejected. In the latter part of 1945, the Commandant established the regulations in 46 CFR 160-164 (Subchapter Q - Specifications). The purpose of these regulations was to bring together in one subchapter all specification regulations pertaining to items of equipment or materials which were required either to be approved by the Commandant or to meet certain minimum standards. This action also separated mandatory requirements dealing primarily with the operation and construction of inspected vessels from the specification requirements primarily applicable to manufacturers of approved equipment and material used on vessels. Each specification is assigned a subpart designated by a basic number consisting of six Arabic numerals. The CFR subpart number is used as the basic number for reference to the specifications, as well as to approvals granted under such specification. No two specifications or subparts have the same number.

Basic approval numbers are assigned to items of approved equipment and material, which are also used as the specification and subpart numbers in the CFR. In order to have uniformity in certain types of equipment, or in the quality of certain materials, a number of specifications do not require each manufacturer to obtain prior specific approval from the Commandant. The specifications and approvals have been separated into five parts, as follows:

- Part 160 - Lifesaving Equipment;
- Part 161 - Electrical Equipment;
- Part 162 - Engineering Equipment;
- Part 163 - Construction;
- Part 164 - Materials.

31-1-30. APPROVED EQUIPMENT AND MATERIALS

Each specification published in Subchapter Q is a complete entity, which sets forth other applicable specifications, materials permitted to be used, types and sizes of equipment, construction and workmanship requirements, markings and inspections required, and procedures for approval, if required. These specifications are intended primarily for the benefit of the manufacturer of equipment or materials. The inspector also benefits because applicable requirements are found together in one document. The requirements in the specifications for obtaining approvals must be followed. If the Commandant is satisfied that the item of approval or material is satisfactory for the purpose intended, an approval certificate is issued to the manufacturer and the approval is published in the Federal Register and in the Equipment Lists. The approval applies only to an item which is manufactured in conformance with the details of the approved plans, specifications, or other data referred to in the approval. Such an approval does not apply to an item which is manufactured with changes is design or to materials not previously approved by the Commandant.

PART 31-2 -- FACTORY AND SHOP INSPECTIONS

31-2-1. GENERAL

This part contains special instructions regarding factory and shop inspections of equipment and materials required to be used on vessels. These instructions implement the requirements of the specifications in 46 CFR 160-164 (Subchapter Q).

31-2-5. ASSIGNMENT OF MARINE INSPECTORS

When necessary, marine inspectors may be assigned to perform factory inspections on a continuous basis. When it is impossible to assign a marine inspector to a plant continuously, the inspector shall make unannounced visits at irregular intervals. In accordance with the applicable specification requirements, random samples shall be selected for testing and inspection to ensure compliance with the requirements of the regulations.

31-2-10. LIFESAVING EQUIPMENT

The tests and inspections of lifesaving equipment shall be made at all places of manufacture of approved devices and shall be conducted in accordance with the applicable specification requirements. Additional tests and inspections should be made when deemed necessary. Their purpose is to prevent the failure of lifesaving devices under actual service conditions as a result of faulty manufacture or fabrication. This includes pyrotechnics and other distress signals inspected and tested under 46 CFR 160.

31-2-15. SERVICING OF LIFERAFTS

31-2-15A. USE OF CARPETING IN SERVICE FACILITIES

Liferaft service facilities should be advised against the use of carpeting in their raft service areas. Carpeting absorbs moisture from the rafts and is extremely difficult to dry out and disinfect. Fungus that has been known to attack rafts made of rubber-coated fabric may breed in this carpet and affect subsequent rafts being serviced. Additionally, this carpet can absorb brass fitting contamination, called "copper oxidation." Although neoprene coated rafts are unaffected by this oxidation, natural rubber-coated fabric rafts, as well as other metal fittings, will become contaminated and deteriorate rapidly. Also, small sharp objects can lodge in carpet and damage rafts.

31-2-15B. FACILITIES FOR SERVICING FOREIGN RAFTS

Requests are being received by the Commandant to inspect U.S. facilities which service foreign rafts. Inspection requests for such facilities may be honored by the OCMI under the following conditions:

(1) The facility shall agree to abide by the provisions of 46 CFR 160.051-6 (except for the stamping provisions of 160. 051-6(e) which does not apply) and the Annex to IMCO Resolution A.333(IX), adopted on 12 November 1975. Following

acceptance of a facility, the Coast Guard need only witness foreign raft servicing on a spot-check basis, but a review of accepted facilities shall be performed at least annually;

(2) The facility shall have written authorization from the raft manufacturer for servicing and an agreement to have the items indicated in paragraph 1(n) of the Annex;

(3) The facility shall keep records of servicing, permit Coast Guard review, and provide an annual written synopsis to Commandant (G-MMT-3) via the OCMI and district commander of the types of problems found with rafts serviced. The latter will allow the U.S. to comply with paragraph 3 of the Annex.

At the completion of a satisfactory evaluation of a servicing facility, the OCMI may issue a letter of acceptance with a copy to Commandant (G-MMT-3). The Commandant, in turn, will list the accepted facility in Equipment Lists, COMDTINST M16714.3, and will notify the home administration of the raft manufacturer. Notices of withdrawals will follow this same procedure.

The Annex to IMCO Resolution A.333(IX) is reprinted in plate 31-2-15.1.

31-2-20. INSPECTION OF LIFE PRESERVERS

The specifications for life preservers (Type I PFD's) in 46 CFR 160.002, 160.005, and 160.055 place a definite obligation on the manufacturer to inspect all life preservers in order to maintain the quality of his product. The marine inspector shall satisfy himself that the life preservers meet all the applicable requirements of the specifications and approved plans. The inspector shall also satisfy himself that the manufacturer is performing sufficient tests and examinations and has an adequate quality-control program such that only those life preservers which the manufacturer believes comply with the specification requirements are presented for inspection. It is the inspector's responsibility to carry out with care and diligence the inspection and test procedures provided for in the specifications, as well as such other tests and inspections as he deems necessary to ensure that each lot of life preservers meets the applicable requirements before they are accepted and marked.

31-2-25. INSPECTIONS OF BUOYANT VESTS, CUSHIONS, RING BUOYS, AND WORK VESTS

31-2-25A. GENERAL

Buoyant vests, cushions, and other devices (Type II, III, IV, and V PFD's) are manufactured in accordance with the requirements of 46 CFR 160.047, 160.048, 160.049, 160.052, 160.060 and 160.064. These specifications do not provide for regularly scheduled factory inspections by the Coast Guard (periodic inspections are conducted by a recognized testing laboratory, such as UL). The specifications do provide that unannounced Coast Guard inspections may be made at the place of manufacture at any time. Further, it is the Coast Guard's responsibility to ensure that the recognized laboratory carries out an adequate inspection program. Communication between the OCMI and the local UL inspector is an effective tool to help ensure compliance by manufacturers.

OCMI's shall ensure that adequate inspections of manufacturers are made. When discrepancies are found, immediate action shall be taken to correct them. A complete report for each unscheduled inspection shall be submitted to Commandant (G-MMT), and shall include the discrepancies found, corrective actions taken, and recommendations for further action where appropriate.

Work vests and ring buoys are manufactured in accordance with the requirements of 46 CFR 160.009, 160.050, and 160.053. These specifications provide for factory inspections by the Coast Guard only. OCMI's shall ensure that such factory inspections are conducted.

31-2-25B. INSPECTIONS AND TESTS

The inspector should impress upon the manufacturer the importance of using only materials of high quality. The quality of the buoyant material used is of prime importance. Inspectors assigned to factory visits shall make such examinations and tests as deemed necessary to ensure compliance with the requirements of the applicable specifications with regard to materials, construction, buoyancy, and workmanship. In all cases, the following examinations and tests shall be made:

(1) Examination of manufacturer's records of buoyancy tests of samples from each lot produced;

(2) Examination of materials used in construction. The manufacturer shall be required to show either by material affidavits, certified test reports, or tests made in the presence of the inspector that all materials are in compliance with the specifications;

(3) Examination of component parts and finished items for compliance with applicable drawings;

(4) Examination of markings for proper wording, lot numbers, approval numbers, etc., and test of markings for waterproofness and legibility;

(5) Tests for strength of seams in heat-sealed, vinyl-covered pad inserts (NOTE: If the manufacturer does not have a testing machine for determining the breaking strength of heat-sealed seams, a simple test procedure, as follows, can be used to determine whether or not the seams possess the required adhesion of eight pounds/inch of width):

- (a) Cut 1" wide test specimens across and perpendicular to seams;
- (b) Attach an 8 lb. weight to one of the test specimens;
- (c) Lift slowly on the other end of the specimen until either the weight is picked up and supported or the specimen breaks;
- (d) If the specimen supports the weight, the seam strength is to be considered satisfactory.

(6) Tests for volume displacement of vinyl-covered pad inserts;

(7) Tests for buoyancy of pad inserts. If kapok-filled pad inserts fail the buoyancy test, then the buoyancy test for processed kapok in accordance with 46 CFR 164.003 shall also be made;

(8) In the test for the strength and slippage of a body strap assembly for a buoyant vest, the minimum breaking strength must be 150 lbs. for the adult vests (300 lbs. in a closed loop) and 115 lbs. for the child-medium and child-small vests (230 lbs. in a closed loop). For work vests, the minimum breaking strength is 360 lbs. (720 lbs. in a closed loop). The test should last for 10 minutes, in which time no more than three inches of slippage is permitted.

31-2-30. IDENTIFICATION OF ENGINEERING MATERIALS

The regulations in 46 CFR 50.25-1 require that certain products (plate, staybolts, valves, etc.) be certified by the manufacturer or mill where produced. 46 CFR Table 50.25-1(a) outlines identification and certification requirements for certain engineering materials. As outlined in 46 CFR 50.15-5 and 50.15-15, certain ASME and ASTM material specifications are adopted for Coast Guard use.

It is not intended that the Coast Guard policy of quality control be abandoned. Those products listed in 46 CFR Table 50.25-1(a), requiring certification by the mill or manufacturer, should be properly stamped in accordance with the applicable material specifications and should be accompanied by the proper manufacturer or mill certification. They may, however, be accepted without such certification, as indicated in 46 CFR 50.25-5. It may be necessary for the inspector to witness the transfer of the stamping as well as additional stamping with the official seal of the Coast Guard, his initials, and a unit serial number. In all cases, the inspector must be satisfied that the material presented to him by the fabricator or repair facility is in fact the same material covered by the mill or manufacturer's certificate.

31-2-35. BOILERS AND UNFIRED PRESSURE VESSELS

Main power boilers and auxiliary boilers shall be designed, constructed, and tested in accordance with Section I (Power Boilers) of the ASME Code, except where limited or modified by 46 CFR 52 (Power Boilers).

Heating boilers shall be designed, constructed, and tested in accordance with Section IV (Heating Boilers) of the ASME Code, except as limited or modified by 46 CFR 53 (Heating Boilers).

Pressure vessels shall be designed, constructed, and tested in accordance with Section VIII (Pressure Vessels) of the ASME Code, except as limited or modified by 46 CFR 54 (Pressure Vessels).

31-2-40. PYROTECHNICS AND DISTRESS SIGNALS

Refer to 46 CFR 160 (Lifesaving Equipment) for the inspection and testing of pyrotechnics and other distress signals.

PLATE 31-2-15.1

IMCO RESOLUTION A.333(IX)
adopted on 12 November 1975

ANNEX

RECOMMENDATION ON THE CONDITIONS FOR THE APPROVAL OF SERVICING STATIONS FOR INFLATABLE LIFERAFTS

1. Administrations should ensure that periodic survey of inflatable liferafts is performed at servicing stations that have demonstrated competence to service and re-pack rafts, maintain an adequate facility and use only properly trained personnel. Servicing stations, which should have demonstrated this capability for inflatable liferafts of each manufacturer whose rafts they service, should comply with the following:

(a) servicing of inflatable liferafts should be carried out in fully enclosed spaces only. There should be ample room for the number of inflatable liferafts expected to be serviced at any one time; the ceiling should be sufficiently high to overturn, when inflated, the largest liferaft to be serviced;

(b) the floor surface should be provided with an easily cleaned coating, sufficiently smooth to ensure that no damage will occur to the liferaft fabric;

(c) the servicing space should be well lit provided that direct rays of sunlight do not enter the space;

(d) the temperature and, when necessary, the relative humidity in the servicing space should be sufficiently controlled to ensure that servicing can be effectively carried out;

(e) the servicing space should be efficiently ventilated, but be free from draughts;

(f) separate areas or rooms should be provided for:
  (i) liferafts awaiting servicing, repair or delivery;
  (ii) the repair of glass fibre containers and painting CO2 cylinders;
  (iii) materials or spare parts;
  (iv) administrative purposes;

(g) means should be provided in the liferaft storage space to ensure that liferafts in containers or valises are not stored in more than two tiers or subjected to excessive loads;

PLATE 31-2-15.1 (continued)

(h) spare and obsolete pyrotechnics should be stored in an approved, safe and secure magazine well away from the servicing and stowage spaces;

(i) sufficient tools should be available for the servicing of liferafts and release gear in accordance with the requirements of the manufacturer including:

  (i) manometers or pressure gauges and thermometers which can be easily read with sufficient accuracy;

  (ii) dual purpose airpump(s) for inflating and deflating liferafts, together with the necessary high pressure hoses and adaptors;

  (iii) a suitable pair of scales for weighing CO2 cylinders with sufficient accuracy;

  (iv) sufficient gas for blowing through the inlet system of the liferafts;

(j) procedures and arrangements should be made to ensure that a gas cylinder is properly filled and gas-tight before fitting to a liferaft;

(k) sufficient materials and accessories should be available for repairing liferafts together with replacements of the emergency equipment;

(l) when servicing davit-launched liferafts adequate means should be provided for overload testing of such liferafts;

(m) servicing and repair work should only be carried out by qualified persons who have been adequately trained to the satisfaction of the Administration. The training procedure should ensure that servicing personnel are made aware of changes and new techniques;

(n) arrangements should be made with the manufacturer to make available:

  (i) changes to servicing manuals, servicing bulletins and instructions;

  (ii) proper materials and replacement parts;

  (iii) bulletins or instructions from the Administration;

(o) smoking should not be allowed in the servicing and packing areas.

2. After initial approval, Administrations should arrange for the frequent inspection of servicing stations to ensure that standards are maintained.

3. Each servicing station should prepare and transmit to the Administration, at regular intervals, statistics showing the nature and extent of damages to and defects found in liferafts during servicing and repair work.

PART 31-3 -- VESSEL EQUIPMENT INSPECTIONS

31-3-1. GENERAL

31-3-1A. REASONS FOR CONTROL OF VESSEL EQUIPMENT

All items of equipment installed on vessels subject to Coast Guard inspection and certification are subject to some degree of inspection and approval. Certain items of equipment are subject to inspection and approval even when carried on board vessels which are not required to be inspected and certificated by the Coast Guard (fishing vessels, yachts, etc.). The extent of the inspection and the type of approval varies with the requirements of laws and regulations and, in general, is dependent upon the hazards involved. When judging the quality and suitability of equipment used on vessels, the following are the primary considerations:

(1) Safety of the Vessel. In order to safeguard the vessel against casualties, equipment must be of good quality and suitable for its intended use. In judging suitability, potential hazards due to fire, explosion, failure of watertight integrity, etc., must be considered along with the risk involved if the equipment fails to function;

(2) Safety of Personnel. The quality and suitability of all equipment must be judged on the basis of obtaining the maximum practicable safety for personnel (passengers and crew). For example, equipment and piping used in connection with dangerous fluids or gases must be designed, constructed, and maintained so as to offer the least practicable hazard to personnel;

(3) Performance of a Safety Function. Many items of equipment on vessels, such as lifesaving equipment and firefighting equipment, are there solely for the purpose of serving a safety function. These items are not used on a day-to-day basis but must perform in an emergency. It is essential that they be of good quality, suitable for the use intended, maintained in good condition, and be ready for immediate use in event of an emergency.

31-3-1B. WHAT THE COAST GUARD CONTROLS

31-3-1B(1). Design. Laws and regulations provide for the proper design of equipment to be used on vessels. The degree of control exerted by the Coast Guard depends upon the potential hazards involved, and is discussed in the inspection regulations. In approving a particular design, Coast Guard personnel must keep in mind the safety of the vessel and its personnel, and the ability of the equipment to perform its intended function in event of an emergency.

31-3-1B(2). Construction. The degree of control exerted is discussed in the regulations. Depending upon the hazards involved, such control might extend to specification of materials, methods of welding or riveting, and inspections and tests during and after construction.

31-3-1B(3). Installation. Although certain matters pertaining to equipment installation are controlled through regulations and plan approval, the primary responsibility for ensuring that the installation is suitable rests with the inspector. Regardless of the general requirements of the regulations or specific approval of plans and specifications, the inspector must ascertain at the initial inspection (during or following installation) that the equipment is safe for the vessel and its personnel, and that it will be able to perform its intended function as installed. Careful consideration is essential at this point since equipment, once installed and approved by the Coast Guard, should not normally be subjected to different requirements at subsequent inspections. In considering the suitability of an installation, the inspector should keep in mind security against movement, safeguards to personnel, and location with respect to other items on the vessel.

31-3-1C. HOW THE COAST GUARD CONTROLS

31-3-1C(1). Standards. Regulations control the standards to be used in the design, construction, and installation of equipment on vessels. In some cases, this is accomplished by specific standards in the regulations; in other cases, by reference to other recognized standards. When no specific standard is given, the equipment is expected to be suitable for its intended use, in the opinion of the OCMI.

31-3-1C(2). Plan Approvals. Plan approval of unfired steam generators and pressure vessels is required unless specifically exempted by 46 CFR 54.01-15 (see also 46 CFR Table 54.10-5(a) for regulatory references governing various types of pressure vessels and boilers. Plans may be required by the Commandant for equipment of new, unusual, or potentially hazardous designs).

31-3-1C(3). Type Approvals. Various regulations require that equipment be of a type approved by the Commandant. When a type approval is required, the Coast Guard establishes specifications or standards which must be met, and manufacturers must show that their products meet these standards before type approval is given.

31-3-1C(4). Tests and Inspections. Regulations require various tests and inspections of vessel equipment to determine its suitability. Depending upon the hazards involved, tests and inspections may be carried out throughout the manufacturing process, during the installation, or both. The purposes of these tests and inspections are to determine whether the equipment meets the applicable standards, whether it is safe for the vessel and personnel involved, and whether it will serve its function.

31-3-1D. RESPONSIBILITY FOR QUALITY OF EQUIPMENT

31-3-1D(1). Manufacturers. Manufacturers of marine equipment have the basic responsibility for supplying equipment that is satisfactory for its intended use and in compliance with the applicable standards. Regulations contain specific requirements for manufacturers to follow in certain cases, but for many items only good commercial quality is required.

31-3-1D(2). Vessel Owners. Owners are expected to supply and maintain the equipment on their vessels in accordance with the applicable regulations. When regulations do not specify requirements for vessel equipment, it is the further responsibility of the vessel owner to supply equipment that is safe and suitable for its intended use. The installation of such equipment shall be performed under the cognizance of the OCMI, and the vessel owner shall be responsible for the continued maintenance of the equipment.

31-3-1D(3). Vessel Officers and Crew. The vessel's officers and crew are required to maintain the equipment in a satisfactory condition and ready to perform its intended function.

31-3-1D(4). Coast Guard Technical Personnel. Coast Guard personnel assigned to the Merchant Marine Technical Division at Headquarters, and to field (mmt) units at the district level, review plans and specifications to ensure that the equipment approved by them is in compliance with applicable laws and regulations, is suitable for intended use, and can be used with safety.

31-3-1D(5). Coast Guard Inspection Personnel. Marine inspectors have the final responsibility for determining whether a piece of equipment is in compliance with requirements; is of suitable design and construction; is constructed according to approved plans; is in a satisfactory condition; and is capable of performing its intended functions safely.

31-3-5. CATEGORIES OF ACCEPTABLE EQUIPMENT

31-3-5A. EQUIPMENT MANUFACTURED UNDER CONTROL OF THE COAST GUARD

Boilers, certain unfired pressure vessels, and other items of equipment are required by law and regulations to be manufactured under Coast Guard control. This equipment requires the submission and approval of plans, specific materials and methods of construction, and tests and inspections by the Coast Guard during and after manufacture. Inspectors are required to determine that the equipment is manufactured and installed in accordance with applicable regulations, and approved plans; that it is constructed of approved materials; that it will withstand the tests specified by regulations; that it is suitable for the purpose intended; and that it can be used safely.

31-3-5B. APPROVED EQUIPMENT

Various items for lifesaving, firefighting, and pollution abatement, and other miscellaneous equipment used aboard inspected and uninspected vessels are required by certain navigation and vessel inspection laws and regulations to be of types which are approved by the Commandant.

In order to be accepted as an approved type, equipment must be manufactured in accordance with standards established in 46 CFR 160-164 (Subchapter Q - Specifications); or, when specifically permitted by regulations, must be in accordance with the standards of a classification society approved by the Commandant. To show that a product is in accordance with the specifications in Subchapter Q, a manufacturer must submit plans and specifications to the Commandant for approval. After approval, the product must be labeled so that it can be identified as approved equipment.

Approved equipment which is required to meet the standards of a recognized society (such as portable fire extinguishers) but which does not require specific plan approval by the Coast Guard must be labeled to show that it meets required standards and can be identified as approved equipment. Types of equipment that are considered to be in accordance with Subchapter Q specifications are formally approved by publication in the Federal Register, and a certificate of approval is issued by Commandant (G-MMT) to the manufacturer of the equipment.

Equipment of an approved type which meets the specifications in Subchapter Q is listed in Equipment Lists, COMDTINST M16714.3.

See section 31-3-10F for information on the approved equipment card index system.

31-3-5C. EQUIPMENT ACCEPTABLE UNDER AFFIDAVIT

46 CFR 50.25 outlines in detail the requirements which manufacturers must meet to have their products accepted on an affidavit basis and be listed in Equipment Lists. Items listed include certain valves, fittings, and flanges. Manufacturers of affidavit products which are not included in Equipment Lists may provide valves, fittings, and flanges for acceptance on an installation basis. Other items including piping, tubing, standard pipe-joining fittings, bolting, castings, forgings, plate, and bar stock may be accepted on the basis of manufacturer or mill certificates. These certificates contain the ASTM specifications, ASME specifications, ANSI standards, or MSS standards, whichever are applicable. 46 CFR Table 50.25-1(a) is an aid to the inspector in determining what is required of the manufacturer.

31-3-5D. EQUIPMENT ACCEPTABLE AFTER TYPE TESTS

Equipment of a given design may be given general acceptance for use on inspected vessels after it has been proved satisfactory by type tests. Coast Guard approval of plans and specifications may also be required, as indicated in section 31-3-5E, prior to type tests. Under 46 CFR 58.30-15(f), hydraulic system components fabricated from certain ferrous or aluminum alloys which exhibit a low ductility must be impact shock-tested by an independent laboratory acceptable to the Commandant. Those hydraulic components which have proven to be satisfactory by impact shock tests are listed in Equipment Lists. Inquiries as to whether a particular testing laboratory may conduct the required tests should be addressed to Commandant (G-MMT).

31-3-5E. EQUIPMENT TYPES ACCEPTABLE UNDER PLAN APPROVAL

Equipment of a given design may receive approval for use on inspected vessels after the Commandant has examined all plans and specifications and has determined that it will meet applicable requirements. Approvals are limited to the installation(s) for which plans were submitted. Previously approved plans may be used for subsequent installations by following the requirements in 46 CFR 50.20-15. Type approvals are issued only under Subchapter Q, or under 46 CFR Table 50.25-1(a) for hydraulic system components which require testing as indicated in section 31-3-5D.

The manufacturers of miscellaneous items of such electrical equipment as navigation light control panels, cable transit devices, general alarm equipment, etc. may submit plans for their equipment to Commandant (G-MMT) for approval. If these items meet the applicable requirements of 46 CFR 110-113 (Subchapter J - Electrical Engineering), they are considered satisfactory for use on inspected vessels. If the equipment has been or is expected to be widely used on vessels, it will be included in Miscellaneous Electrical Equipment List (CG-293) as acceptable for the locations listed.

31-3-5F. PORTABLE EQUIPMENT

Items of portable electric equipment may be accepted in several ways and thereby listed in CG-293. Portable cargo lights are covered under the "UL Standards for Marine-Type Electric Lighting Fixtures." These lights have a label indicating UL approval as a "marine type." Portable items covered by either of these categories are considered satisfactory. Portable items not listed in CG-293 nor labeled by UL must be checked to ensure compliance with Subchapter J. Portable fixtures should be referred to the nearest field (mmt) office for determination. Approval of portable lighting devices by inspectors is not advisable, since temperature test data are needed to properly evaluate these fixtures.

Portable tools can be accepted if the design appears to be a good commercial design. One way to check this is to see if the product is listed by UL under the classification "Tools - Commercial Type."

31-3-5G. INDIVIDUAL EQUIPMENT ACCEPTED UNDER STANDARDS OF RECOGNIZED SOCIETIES

Individual items of equipment are acceptable for use on inspected vessels when shown to meet the standards of a classification society specified by the applicable regulations. For example, 46 CFR 58.01-5 provides for the acceptance of main and auxiliary machinery which meets the standards established by the American Bureau of Shipping (ABS). Lighting fixtures listed under the UL Standard for Marine-Type Electric Lighting Fixtures are accepted for use on inspected vessels (see 46 CFR 111.75-20).

Other electrical equipment such as boxes, switches, etc., that have a UL "Marine Listing" or "Marine Listing for Vessels Over 65 Feet" are also acceptable for use on inspected vessels provided they have the necessary rating and their enclosures are appropriate for the location in which the devices are to be installed.

31-3-5H. EQUIPMENT REQUIRED TO MEET INSTALLATION STANDARDS

Throughout the regulations, there are requirements covering the safe installation of equipment, and in many cases, specific inspections and tests are required during or after installation.

31-3-5I. PERMITTED ARTICLES OF A DANGEROUS NATURE

Articles of a dangerous nature for ships' stores and supplies are prohibited by 46 CFR 146-148 (Subchapter N - Dangerous Cargoes) unless specifically permitted on board. Certificates are issued to manufacturers of permitted articles, which comply with the requirements of 46 CFR 147 (Regulations Governing Use of Dangerous Articles as Ships' Stores and Supplies On Board Vessels).

31-3-5J. EQUIPMENT FOR WHICH STANDARDS ARE NOT SPECIFIED

Items of equipment for which specific standards are not specified by law or regulations are required to meet an acceptable standard of safety and must be suitable for the purpose intended. Normally, articles of this nature which meet the standards of a recognized code or are in accordance with "good marine practice" will be considered suitable by the Commandant.

31-3-5K. EQUIVALENT EQUIPMENT

Throughout the regulations there is authority for the Commandant, district commander, or OCMI to accept substitute equivalent equipment, equivalent materials, and alternate materials or methods of construction. As an example, equivalence has been filed with IMCO for substitution of liferafts for lifeboats on vessels of less than 1600 G.T. on international voyages, under certain conditions. The text of the equivalency notice is as follows:

Regulation 35 of Chapter III of the International Convention for the Safety of Life at Sea (SOLAS), 1960 provides that every cargo ship, with certain exceptions, shall carry lifeboats on each side of the ship of such aggregate capacity as will accomodate all persons on board and, in addition, shall carry liferafts sufficient to accommodate half that number. The Government of the United States of America gives notification of acceptance of the following equivalent arrangement under the provisions of regulation 5, Chapter I of the convention:

Cargo vessels of 500 G.T. and over but less than 1600 G.T., except tankers, may be equipped as follows:

(1) On each side of the vessel, one or more davit-launched inflatable liferafts of sufficient capacity to accommodate the total number of persons on board;

(2) A minimum of one launching device on each side of the vessel. Operation of the raft launching device shall not require anyone to remain on board;

(3) Sufficient float-free inflatable liferafts with capacity to accommodate not less than one half of the total persons allowed on board;

(4) On a vessel for which persons on board will have an escape route not requiring them to board inflatable liferafts by first entering the water nor to descend to them a distance in excess of 4 1/2 meters, float-free inflatable liferafts of sufficient capacity on each side of the vessel to accommodate the total number of persons on board may be substituted for the davit-launched rafts and launching equipment required by (1) and (2) above;

(5) A motor-propelled rescue boat suitable for ocean service with a davit or other suitable launching device capable of launch by no more than three persons.

In accepting this equivalent arrangement, the United States has taken account of two separate sea trials, as well as actual experience gained on vessels not subject to the provisions of SOLAS 60. The sea trials referred to were conducted with motor vessels subject to the convention that were designed as supply vessels for offshore drilling sites. In accordance with current regulations, only the Commandant can approve such an arrangement. Requests for such substitutions shall be forwarded to Commandant (G-MVI).

31-3-10. REFERENCES

31-3-10A. LAWS

Many of the vessel inspection laws provide for Coast Guard control of equipment used on inspected vessels, uninspected vessels, and boats. Some of the laws which are specifically concerned with equipment are as follows:

(1) 33 U.S.C. 1321: Provides for regulations governing procedures, methods, equipment, and other requirements for vessels to prevent discharges of oil and hazardous substances for vessels;

(2) 46 U.S.C. 366: Provides for the acceptance of boilers, steam pipes, and appurtenances of foreign vessels admitted to U.S. registry;

(3) 46 U.S.C. 369: Provides for the approval of equipment by the Commandant, with the advice and assistance of his technical staff;

(4) 46 U.S.C. 390b: Authorizes the Coast Guard to prescribe regulations to control equipment on small passenger vessels;

(5) 46 U.S.C. 391: Requires the proper maintenance of equipment on inspected vessels and requires that defective life preservers or firehoses be destroyed when they cannot be repaired;

(6) 46 U.S.C. 391a: Authorizes the Coast Guard to prescribe regulations covering the equipment used on tank vessels;

(7) 46 U.S.C. 392: Specifies the time intervals for inspection of boilers, unfired pressure vessels, machinery, electrical apparatus, etc. on inspected vessels;

(8) 46 U.S.C. 406-412: Controls construction standards for boilers and other pressure vessels;

(9) 46 U.S.C. 435: Provides for the reinspection of vessels and requires the proper maintenance of equipment on inspected vessels;

(10) 46 U.S.C. 473: Contains provisions for steering, navigation, and signaling apparatus;

(11) 46 U.S.C. 481: Authorizes the Coast Guard to establish regulations to control the equipment on inspected vessels; covers lifesaving equipment, firefighting equipment, ground tackle, bilge systems, etc.;

(12) 46 U.S.C. 489: Requires that equipment used for the better security of life be approved by the Coast Guard;

(13) 46 U.S.C. 526 and 1451: Impose construction, equipment, and other requirements on uninspected vessels and boats.

31-3-10B. TREATIES

SOLAS 60 contains specific requirements for the equipment used on vessels making international voyages. These requirements are also in the regulations.

The International Load Line Convention, 1966 contains provisions affecting equipment used on inspected vessels. These provisions are also discussed in chapter 76, volume V of this manual.

31-3-10C. REGULATIONS

Throughout the vessel inspection regulations there are specific requirements controlling the equipment used on inspected vessels, uninspected vessels, and boats. Some of these are:

(1) 33 CFR 151-159 (Subchapter O - Pollution) contains requirements for oil and hazardous substance equipment such as oil-water separators, oil content monitors, and alarms, as well as marine sanitation devices;

(2) 33 CFR 173-183 (Subchapter S - Boating Safety) contains safe powering and equipment requirements for recreational boats and boats carrying six or less passengers;

(3) 46 CFR 2.75 contains requirements and procedures for equipment type approvals, information on the filing of affidavits by equipment manufacturers, and requirements covering the acceptance of portable fire extinguishers;

(4) 46 CFR 2.95-10 contains information and requirements concerning retention of records with respect to approved equipment by manufacturers;

(5) 46 CFR 160-164 (Subchapter Q - Specifications) contains specifications for equipment which is given type approval.

It should be noted that equipment which is not mentioned in the regulations must still be acceptable to the Coast Guard.

31-3-10D. EQUIPMENT LISTS, COMDTINST M16714.3 (old CG-190)

Equipment Lists contains a listing of various lifesaving, firefighting, pollution abatement, engineering, electrical, and miscellaneous equipment used on vessels. These items are approved or accepted by the Commandant as required by certain laws and regulations. This publication contains four sections:

(1) Approved instruments, machines, and equipment;

(2) A list of manufacturers who have submitted affidavits for valves, fittings, and flanges;

(3) Acceptable hydraulic components; and

(4) Formerly approved instruments, machines, and equipment which are no longer manufactured as approved equipment. Unless otherwise noted, the items listed may be used as long as they are in good and serviceable condition.

Changes to this publication are issued in the Federal Register and reprinted in the Proceedings of the Marine Safety Council (CG-129).

31-3-10E. MISCELLANEOUS ELECTRICAL EQUIPMENT LIST, CG-293

The publication Miscellaneous Electrical Equipment List (CG-293) contains a list of miscellaneous electrical equipment which has been found to be generally satisfactory for use on merchant vessels. The items of equipment listed are, in general, limited to those which are frequently and routinely used on inspected merchant vessels, and which comply with the applicable requirements of Subchapter J. This publication was developed to save time in approving plans for vessels under construction in accordance with Subchapter J. Electrical equipment which requires a formal approval by the Commandant is listed in the Equipment Lists.

Examples of the items of electrical equipment listed in CG-293 are navigation light control panels, cable transit devices, engine order telegraphs, etc. Items for motorboats and for other vessels employing low voltage systems are not listed. Before a piece of equipment is listed in this publication, the Coast Guard will determine if it will be used frequently or routinely in marine service.

The listing of electrical equipment in CG-293 is not a prerequisite of approval for such equipment on inspected vessels. Such items will continue to be approved on an individual basis. Manufacturers of miscellaneous items of electrical equipment of the type listed in CG-293 who desire to qualify their products for listing in the publication should follow the procedures outlined in its introduction.

31-3-10F. EQUIPMENT CARD INDEX SYSTEM

Types of equipment that are considered to be in accordance with Subchapter Q are approved by Commandant (G-MMT) and a Certificate of Approval, Form CGHQ-10030, is issued to the manufacturer of the equipment. This certificate describes the equipment, and is valid for five years from the date of signature unless cancelled or suspended by proper authority. The certificate remains valid only so long as the item specified is manufactured in conformance to the details of the approved plans and specifications submitted for that item.

An index system for equipment approval cards has been furnished to each field (mmt) office and OCMI by Commandant (G-MMT). Cards in this file duplicate the information found on the Certificate of Approval, and represent a complete record of approved equipment, with current supplements transmitted to provide each unit with accurate, up-to-date information on approved equipment.

The success of such a system depends upon its proper maintenance. Each unit and staff utilizing this system should designate a custodian to maintain the system.

31-3-10G. PROCEEDINGS OF THE MARINE SAFETY COUNCIL, CG-129

This publication contains monthly revisions to the Equipment Lists and the equipment card index system. It is the only source of information on corrections to the lists of equipment which are not of an approved type (such as equipment accepted under affidavit, etc.).

31-3-10H. FEDERAL REGISTER

Changes to the lists of approved equipment found in the Equipment Lists are also published in the Federal Register (see 46 CFR 2.75-1(c)).

31-3-15. MARINE ENGINEERING EQUIPMENT

31-3-15A. UNFIRED PRESSURE VESSELS

31-3-15A(1). Construction Standards. Pressure vessels subject to inspection by the Coast Guard shall be designed, constructed, and tested in accordance with the requirements of 46 CFR 54, which modifies the rules of Section VIII (Pressure Vessels) of the ASME Code. All pressure vessels intended for ships' service, such as compressed air tanks, heat exchangers, and refrigeration equipment are covered by these rules.

Section VIII does not completely cover heat exchangers. For cases not specifically covered, the standards of the Tubular Exchanger Manufacturers Association (TEMA) have been adopted.

Construction shall comply with the applicable requirements concerning welded joint design, permissibility of materials, handhole or manhole openings, nozzle attachments (whether screwed or welded), etc.

Repairs to pressure vessels constructed to ASME standards shall be accomplished in accordance with 46 CFR 59.10. This includes repairs to welded, riveted, or brazed unfired pressure vessels.

31-3-15A(2). Hydraulic Accumulators. Hydraulic accumulators are inspected, stamped, and approved in a manner similar to pressure vessels, including the use of the Manufacturer's Data Report for Boilers, Pressure Vessels, or Nuclear Pressure Vessels, Form CG-2936. Regulations dealing with the peculiarities of these accumulators are established in 46 CFR 58.30-25, while 46 CFR 54 details the general design, fabrication, inspection, testing, and stamping requirements.

Existing installations that do not have Coast Guard-stamped accumulators shall be referred to Commandant (G-MMT-2). All nameplate data should be submitted for evaluation.

The biennial inspection of accumulators, as required by 46 CFR 61.10-5, shall be limited to an operating test to preclude damage to the internal parts of the accumulator.

31-3-15A(3). Compressed Air Cylinders/Pressure Vessels In Totally Enclosed Lifeboats. Two types of cylinders/pressure vessels are approved for use in totally enclosed lifeboats on offshore platforms, mobile offshore drilling units (MODU's), and other vessels. These compressed air systems provide both combustion air for the engine and breathing air for the crew when operating in a closed condition. One type of pressure vessel is approved by the Coast Guard under the provisions of 46 CFR, Subchapter F. The other type is approved under the provisions of (DOT) Materials Transportation Bureau (previously ICC) Regulations, 49 CFR 173 and 178, Subpart C. The type of cylinder/pressure vessel can be identified by its markings.

Coast Guard-approved pressure vessels should be periodically inspected and tested as required by 46 CFR 61.10. DOT (ICC) cylinders should be periodically inspected and tested as required by 49 CFR 173.34(e).

31-3-15B. WELDING EQUIPMENT

31-3-15B(1). Electric Welding Equipment. There are no specific regulations to prevent the installation of electric welding machines on vessels, including passenger, tank, and cargo vessels. However, 46 CFR 50.05-10, 91.45-1(a), 35.011, 71.55-1, etc. require the approval of the OCMI before repairs are undertaken with such systems.

The installation of electric welding machines should be discouraged on tank vessels. Plans and specifications covering the installation of welding machines on any vessel shall be submitted to Commandant (G-MMT) for approval. When welding machines are permitted, adequate instructions on the safe use of the machines shall be posted on the vessel. These instructions should call attention to the Coast Guard regulations concerning repairs to vessels and their equipment.

31-3-15B(2). Oxy-Acetylene Welding Equipment. Specific permission from the OCMI is not required for a vessel to carry oxy-acetylene welding equipment. When such equipment is carried, however, it must be stored in accordance with, and in quantities not in excess of those allowed by, 46 CFR 147.05-100. Suitable safety instructions on the use of the equipment shall be posted on the vessel.

31-3-15C. PIPE FITTINGS

31-3-15C(1). Cargo Hose Couplings. Oil transfer hoses carried aboard vessels are subject to the requirements of 33 CFR 154.500. Each hose assembly must have full-threaded connections, flanged connections that meet ANSI standard B16.5 or B16.31, or quick-disconnect couplings that are acceptable to the Commandant. Commandant (G-MMT) maintains a list of acceptable quick-disconnect couplings.

31-3-15C(2). Inspection of Flexible Hose Assemblies. Commandant (G-MMT) maintains a list of nonmetallic flexible hoses which meet the requirements of 46 CFR 56.60-25(c). These hoses have exterior coverings which, when damaged, could allow moisture to enter the area of the inner tube material and wire braid. This moisture could cause rapid corrosion and failure of the hose.

To ensure reliability of these systems, a thorough examination of these hoses at the regular vessel inspection period shall be made. Minor breaks, cuts, or abrasions in the covering may be allowed; however, the hose shall be replaced if corrosion of the interior material is found.

The use of flexible hoses in some systems is permitted. See 46 CFR Table 56.60-25(c) and its footnotes for limitations.

31-3-15C(3). Flexible Pipe Couplings. The regulations in 46 CFR 56.30-35 and 40 describe the limitations and installation requirements for the various types of flexible pipe couplings. The OCMI shall be satisfied that new and existing flexible pipe couplings are adequate and suitable for the service intended and installations are made in accordance with the procedures prescribed therein.

31-3-15D. SPARK AND FLAME ARRESTERS

31-3-15D(1). Spark Arresters in Exhaust Lines. 46 CFR 58.10-5, 58.10-10, 182.15-20, and 182.20-20 contain requirements for spark arresters in gasoline and diesel engines. The Coast Guard does not have a specification for such spark arresters. They shall be accepted after the installation is made and it is demonstrated that the spark arrester will effectively prevent the emission of glowing embers.

31-3-15D(2). Flame Arresters for Gasoline Engines. Subchapter Q specifications 162.041, 162.042, and 162.043 cover the requirements for construction of backfire flame control on engines employing specific types of air and fuel induction systems. If a manufacturer of an engine believes that his design precludes the necessity of a flame arrester, his request for special consideration should be submitted to Commandant (G-MMT) as required by these specifications (see also 46 CFR 25.35 for backfire flame control requirements on uninspected vessels. Note the regulations in 46 CFR 25.35-1 (e)(3) concerning installations which do not require formal approval and labeling but which will be accepted by the Coast Guard).

31-3-15E. EQUIPMENT USING LIQUEFIED PETROLEUM GAS

31-3-15E(1). Use on Inspected Vessels. The use of liquefied petroleum gas (LPG) for cooking and heating, permitted by 46 CFR 58.16 on cargo vessels, is prohibited on inspected passenger vessels. Also, the use of LPG for internal combustion engines is not permitted on inspected vessels.

There is no prohibition against the installation and use of LPG-consuming appliances below the weather deck on cargo and miscellaneous vessels so long as the installation complies with the regulations in 46 CFR 58.16. In this regard, 46 CFR 58.16-20 specifically refers to installations below the weather deck in stating requirements for ventilation; 46 CFR 58.16-18 requires that the gas cylinders, regulators, and safety equipment be installed above the weather deck.

The commercial use of LPG is receiving greater attention. If a company has a given type, size, or class of installation that it proposes as safe for use below decks, full details ofthe system should be submitted to Commandant (G-MMT).

31-3-15E(2). Hot Water Heaters. Gas-fired hot water heaters employing LPG are covered in 46 CFR 58.16 since they are considered to be used for heating purposes. For such purposes, the Commandant will accept units approved by the American Gas Association.

31-3-15E(3). Uninspected Vessels. On uninspected vessels carrying passengers for hire, the use of LPG and certain flammable liquids for cooking, heating, or lighting is prohibited by 46 CFR 146-147 (see also 46 CFR 25.45).

31-3-15F. KEEL COOLERS

The use of keel coolers for commercial vessel applications has been increasing. Most keel coolers are integral parts of the hull (generally, extra-heavy pipe halves or structural angles welded to the bottom of the vessel); independent units known as grid coolers have also been emphasized. Keel coolers should be fitted with shut-off valves located at the skin of the vessel, as required by 46 CFR 56.50-96. However, if the OCMI determines that the shut-off valves are impossible to install, the installation may be accepted without shut-off valves if the mounting on the vessel, the strength of the cooler, and the details of the entire installation make the keel cooler at least as strong as the shell of the vessel.

31-3-20. MISCELLANEOUS DECK EQUIPMENT

31-3-20A. FRESH AIR BREATHING APPARATUS

Coast Guard personnel who examine fresh air breathing apparatuses shall check the material condition of the facepiece, headband, connecting tube, and all junctions of each apparatus, and shall ensure that the necessary lengths of hose are available. The entire length of hose shall be examined for pliability and signs of deterioration, cuts, and cracks. Although vessel regulations specify 150-ft maximum lengths, fresh air lines of up to 300 feet have proven satisfactory in tests, and it is planned to amend the regulations accordingly.

On tank vessels, an approved self-contained breathing apparatus may be substituted for the fresh air breathing apparatus required for the machinery spaces when excessive lengths of hose would be necessary to reach all areas of the space. This self-contained equipment must be in addition to the fresh air breathing apparatus and hose for the tanks and holds. It must be stowed and appropriately marked to indicate that it is to be used in machinery spaces only. Additional approved self-contained breathing apparatus may be carried and used in any space on the vessel.

Additional breathing apparatus need not be provided for refrigerated areas utilizing Freon 12 as the refrigerant. Since leaks are generally small, compared with the volume of the enclosure, the buildup of hazardous concentrations of Freon 12 is very unlikely. If deemed necessary, breathing apparatus already required may be used, except that universal gas masks are ineffective for this purpose.

31-3-20B. REFLECTORIZED SIGNS

Prior approval is not required for the use of "Scotchlite" signs on merchant vessels. The Commandant has no objection to the use of reflectorized signs for marking emergency equipment, instructions, routes, etc. However, care must be taken to ensure that such signs comply with the intent and the specific details of the applicable regulations governing required markings. The use of reflectorized signs is subject to any special limitations which may, for sufficient reason, be imposed by the OCMI within whose jurisdiction the vessel is inspected.

31-3-20C. LASH VESSEL LIGHTER CRANES

The extension of lighter guides on board lighter-aboard-ship (LASH) barge-handling cranes has created a significant personnel safety hazard. In separate incidents, despite various safety precautions, two crew members and three longshoremen have been killed while lighters were being discharged from these vessels. These men were caught by the crane's hydraulically extended lighter guides and crushed against a corner of the barge being discharged. Operators of LASH vessels are required to take corrective action in accordance with 46 CFR 92.25-15. No specific method of personnel protection is required; however, any action must provide a degree of safety equivalent to that afforded by:

(1) The installation of a mechanism to provide delay of no less than three seconds' duration between actuation of the lighter guide extension controller and initial movement of the guide arms; and

(2) A distinctive audible alarm to be sounded continuously during the delay and guide extension periods, with individual sound sources located on each crane leg in immediate proximity to the point(s) of danger.

At each inspection or reinspection for certification, the lighter crane on LASH vessels shall be examined to ensure that the hazard described above has been corrected to the satisfaction of the OCMI, through the installation of guards, rails, or effective warning devices to minimize personnel danger. Plans and specifications submitted for approval shall be reviewed by the cognizant OCMI.

31-3-25. ELECTRICAL EQUIPMENT

31-3-25A. APPROVED EQUIPMENT

See sections 31-3-10D and E for information on electrical equipment considered acceptable for use on inspected vessels.

31-3-25B. NAVIGATION LIGHTS

31-3-25B(1). General. Regulations require vessels to be equipped with navigation lights as prescribed by law. The Rules of the Road specify the requirements for lights in terms of colors, and arcs and ranges of visibility; the International Rules of the Road specify additional technical details for navigation lights. Navigation Rules, International-Inland, CG-169, should be consulted for the applicability of these additional technical details. Lights required to meet the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS), which became effective on 15 July 1977, must be specifically approved by Commandant (G-MMT) or be listed by UL. The regulations applicable to electric-type navigation lights are contained in 46 CFR 111.75-17. There are no regulations which specifically prohibit the use of non-electric lights, except where the use of open flames is prohibited; however, the requirement for a navigation light indicator panel (see 46 CFR 111.75-17) precludes the use of non-electric lights on many vessels. Non- electric lights shall be shown by test to meet the applicable intensity requirements. See COMDTINST 16672.1 for navigational light requirements pertaining to small boats.

31-3-25B(2). Side-Light Screens. Side-light screens are required to be painted a matte (flat) black to comply with the 72 COLREGS.

31-3-25C. CARTRIDGE FUSES

On 4 December 1959, 46 CFR 111.53 was amended to require that cartridge fuses, if used, were to be of a non-renewable type. Electrical regulations are generally not retroactive, unless specifically called for in the regulations. Thus, inspectors shall encourage the use of non-renewable cartridge fuses in all cases, but may require replacement of renewable link cartridges only for those vessels contracted for on or after 4 December 1959.

31-3-25D. MARINE TYPE LIGHTING FIXTURES

The Commandant will accept fixtures listed by UL and labeled "Marine Type" light fixtures for installation on inspected vessels. The Commandant, however, reserves the right to reject any fixture not considered suitable for a specific application. Submission of drawings to the Coast Guard for approval will not be required for fixtures so listed and labeled.

If a particular lighting fixture has a UL marine label, this does not mean that it may be installed in any location on inspected vessels. For example, in hazardous locations the fixture must be of suitable explosion-proof construction and must be so labeled. UL listings are divided into three classes: "Inside," "Inside-dripproof," and "Outside." The "outside" type of fixture shall be used where exposed to the weather or in spaces where exposed to seas, splashing, or similar moisture conditions. Fixtures installed in other wet or damp locations shall be at least of the "insidedripproof"type. Where the regulations permit only incombustible materials in passageways and stairway enclosures, only incombustible materials such as metal and glass are permitted in fixture housings.

Shipboard cable used to connect UL marine-type lighting fixtures must have the type of insulation required by UL's listing, to ensure that the cable insulation is suitable for the operating temperature of the fixture.

31-3-25E. TELEVISION AND RADIO ANTENNAS

The Coast Guard has no rules covering installation of television and radio antennas on vessels. Federal Communications Commission (FCC) inspectors may require changes in an antenna installation if it is determined that such installation will interfere with the proper functioning of the vessel's main radio transmitter or receiver. Television antenna installations on inspected vessels are considered to be under the cognizance of the master or a competent crewman designated by him. Coast Guard inspections shall normally be limited to spot-checking for unsafe conditions and overall safety.

31-3-25F. RADAR INSTALLATIONS

The FCC has jurisdiction over marine radar installations.

31-3-30. LIFESAVING EQUIPMENT

31-3-30A. GENERAL

31-3-30A(1). Equipment Approvals. Navigation and vessel inspection laws require that life preservers, ring buoys, lifeboats, liferafts, and certain other types of lifesaving equipment be approved by the Commandant. This approval must be granted before the equipment is placed on the vessel for use as part of the lifesaving equipment. It is of the utmost importance that all lifesaving equipment and appliances are of the best quality and maintain high efficiency.

Tests and inspections of lifesaving equipment at the inspection for certification are covered in detail in the various regulations. The instructions in this subpart are intended to cover the situations requiring particular attention or further explanation. NVC 2-63 is a guide for the inspection and repair of lifesaving equipment, and inspectors shall use the recommended procedures in this circular as a guide.

31-3-30A(2). Alterations of Approved Equipment. In every case where lifesaving equipment or appliances directly connected therewith cannot be manufactured in accordance with the approved design or specification, substitutions shall not be made until they have been first brought to the attention of Commandant (G-MMT), via the district commander, for consideration and acceptance.

31-3-30A(3). Enforcement of Penalties. It has come to the Commandant's attention that certain lifesaving equipment has been manufactured and sold to the maritime industry under approved labels despite such equipment's failure to conform to either the material specifications or design, or both, as originally approved by the Coast Guard. On occasion, this equipment has failed to function properly in an emergency, or the equipment has been found to be deficient under service conditions. Such practices will not be tolerated. If such practices come to the attention of a marine inspector, OCMI, or district commander, steps should be taken to suspend the approval or invoke the various penalties and sanctions provided. This includes prosecution under 46 CFR 2.75-40 and 2.75-50 or 46 U.S.C. 481 (see 14 U.S.C. 639 for enforcement action concerning items which have never received Coast Guard approval but are advertised as having done so).

31-3-30A(4). Excess Lifesaving Equipment. Excess lifesaving equipment carried on inspected vessels shall be of an approved type and kept in good operating condition.

31-3-30B. LIFEBOATS

31-3-30B(1). Recertified Lifeboats. Requests for the reduction in the number of persons a lifeboat is certified to carry are sometimes made in order to avoid overloading the davits, or because the owners do not wish to equip a boat with excessive food and water, over and above the requirements for the personnel on board. In such cases, the OCMI may accept such a request if:

- The reduced capacity of the lifeboats is adequate to accommodate the personnel on board;

- The old capacity painted on each bow and the thwarts is deleted and the new capacity substituted therefor;

- An additional nameplate is affixed to the bow showing that it has been recertified for a different number of persons, which shall also contain the boat's serial number, date of change, port, and the inspector's initials; and

- The Certificate of Inspection (COI) for the vessel is amended, or an amending certificate attached thereto.

A request for an increase to the original number of persons for which a lifeboat was approved should be handled in a similar fashion as for a decrease in number. In such a case, however, the weight of the fully-equipped and loaded lifeboat shall not exceed the approved working load of the davits. If the request is granted and capacity increased to the original number of persons for which the lifeboat was approved, the old capacity painted on each bow and the thwarts shall be deleted and the new capacity substituted therefor. If fitted, the additional nameplate showing the reduced capacity shall be removed. The COI for the vessel shall be amended to reflect the increased lifeboatage.

31-3-30B(2). Lifeboat Releasing Gear.

(a) Mills-type. The Mills-type releasing gear was approved on 12 January 1943, for installation by the Imperial Boat Co. This releasing gear had no retaining device to prevent the accidental release of the hook attachment if the lifeboat should become temporarily waterborne during launching operations in a rough sea. When hooks of this character are found on a vessel, this condition shall be checked and corrected. A satisfactory means of remedying this fault is to have a small flat bar welded to the cheek plate of the lower block;

(b) Steward-type. The Steward-type releasing gear presents problems similar to the Mills-type releasing gear and should be checked at each inspection. While this type of gear has a retaining device which is attached to this gear, this device has been found in a defective condition or entirely broken off due to neglect or mistreatment. New retainer devices, similar to the ones approved for the gear, should be installed when a condition of this nature is found;

(c) Rottmer-type. In some instances, examination of installations of the disengaging apparatus has shown that in lifeboats fitted with Rottmer-type releasing gear, lifeboat footings had been placed over the release gear lever. This requires the lifting of such footings before the releasing gear may be operated. Such a practice is unsafe and shall be corrected. A clear open space shall be provided in the way of the release gear lever. The footings shall be removed from this space and should be stowed and well-secured elsewhere in the lifeboat until after the lifeboat is launched and clear of the ship. A stenciled notice to this effect shall be provided on the footings thus stowed. At all annual inspections, when examining the condition of the disengaging apparatus in lifeboats fitted with Rottmer-type releasing gears, particular attention shall be directed to the center pieces of the universal joints in the releasing mechanism. If the center pieces indicate any undue stress, such as bent lugs, hairline cracks, etc., they shall be replaced with center pieces made from solid bronze. In addition, the upper and lower guide bearings of the releasing gear should be thoroughly lubricated and the releasing mechanism tested for satisfactory operation. Ship's officers shall be instructed to lubricate the upper and lower guide bearings periodically;

(d) Installations In Existing Lifeboats. When releasing gears are to be welded to the stem, sternpost, or keel of an existing lifeboat, the welding details shall be in accordance with approved drawings for new installations and the welding shall be done by a qualified welder. The plating shall be removed in way of welds in order to permit the welder to have a clear lead and to insure a proper weld. All galvanized surfaces within two inches of the area to be welded shall be ground to bare steel. The areas in way of the welded and ground surfaces shall be given two coats of red lead, zinc chromate, or an equal coating with reasonable drying time between them.

31-3-30B(3). Weight Tests of Lifeboat Installations. Certain regulations (46 CFR 91.25-15(a)(2) and 94.35-5, for example) provide for the weight testing of lifeboat installations. Persons are not permitted to be used in the proof test after installation. Deadweight is to be used in these tests, and sandbags of a size that can be distributed throughout the boat are normally utilized. In cases when the owner so requests or clearly states that he has no objection, the specified amount of weight may be added to the lifeboat by filling with the required amount of water. However, this method should not be used in those lifeboats where, in the opinion of the inspector, the addition of water would damage the mechanical parts of the boat.

The working-load weight test during annual and biennial examinations is of special value in checking deck connections of the davit footings. Deterioration in this location is difficult to detect, and weight tests are the only positive means to ascertain proper strength. This is not meant to test for safety factors but to check those parts which cannot be checked visually, and to identify defects which would otherwise not have been detected.

31-3-30B(4). **Hand-Propelled Lifeboats**. This is a lifeboat fitted with hand-operated propelling gear which meets the requirements set forth in regulation 10, Chapter 3 of SOLAS 60. It is not to be confused with a motor lifeboat, which has different specifications and requirements by SOLAS 60. Accordingly, an oar-propelled lifeboat does not qualify as a hand-propelled lifeboat (see 46 CFR 160.034).

31-3-30B(5). **Steel Wire Sea Painters**. The Coast Guard does not approve of the use of steel wire in lieu of manila line for sea painters. Such wire is not as easy to handle, may be difficult to release under tension, and can develop short ends of wire ("fishhooks") which are injurious to bare hands.

31-3-30B(6). **New Nameplates For Lifeboats**. When the nameplate on a lifeboat is no longer legible, the inspector shall require it to be replaced. The new plate should normally be obtained from the manufacturer of the lifeboat and should be similar to and contain the same information as the original. When the replacement cannot be obtained from the manufacturer, a new one should be fabricated under the cognizance of the OCMI. The new plate should be made of brass or bronze and stamped thus:

Manufacturer's Name

Serial No. __________
Length_____Beam_____ Depth _______
Capacity_______cu. ft.___Persons_____
Air Tanks___cu.ft.______Built_______
Weight of Boat in Condition A & Condition B
REPLACEMENT NAME PLATE
Inspector (initials) USCG Port_____
Date___________

The inspector shall check the installation of the new nameplate, make an appropriate entry in the vessel's inspection files, and stamp the new nameplate with his initials.

31-3-30B(7). **Plastic Buoyancy Units for Lifeboats**. Plastic buoyancy units which have been approved shall be used to replace metal air tanks in lifeboats used on inspected vessels (including tank vessels). These units are approved on the basis of samples, plans, and affidavits submitted by the manufacturer, tests of the product by the Coast Guard, and a check of the manufacturing procedure by the field (mmt) office. When authorized by the Commandant, the (mmt) office may write a letter to the manufacturer stating that his product is acceptable for use in lifeboats. Such units are *not* given approval certificates.

Inspectors may recognize the acceptable units by the nameplate in the following format:

Type (or Model)__________
Lifeboat Buoyancy Unit
Cu. Ft.______ Date________
Wgt._______
Name & Address of Manufacturer

Plastic buoyancy units produced by a manufacturer, whose units have been given approval, may be accepted for use in lifeboats subject to the following two conditions:

(a) When used as replacements for metal air tanks in existing lifeboats, the buoyancy units shall be the same size and shape as the metal tanks they replace; and

(b) Each installation of buoyancy units in approved lifeboats shall be satisfactory to the OCMI having jurisdiction at the place where the installation is made.

31-3-30B(8). Repairs to Built-In Side Tanks By Foam-In-Place Materials. Certain foam-in-place materials, such as rigid polyurethane, have been authorized for use as a repair method for lifeboats with built-in side tanks as well as for other types of lifeboats, at the discretion of the OCMI. Such repairs shall be made in accordance with NVC 2-63 and an appropriate entry shall be made in the vessel's Hull Inspection Book List of Equipment (Form CG-840A).

31-3-30B(9). Equipment Required For Totally Enclosed Lifeboats on Artificial Islands. 33 CFR 144.01-15(b) details required equipment for lifeboats. This regulation was developed for standard, open-type lifeboats and is not entirely adequate for enclosed boats or survival capsules. In light of this, the following equipment shall be required in enclosed lifeboats and survival capsules:

(a) Bilge pump (a hand bailer is inadequate, since water cannot be thrown over the gunwale as in an open boat);

(b) Boat hook;

(c) Bucket;

(d) Hatchet;

(e) Installed interior lighting, or at least two operational flashlights securely attached to the inside of the canopy; lanterns are not considered to be practical for enclosed boats;

(f) Life line;

(g) Two life preservers;

(h) One spare set of batteries for each flashlight;

(i) Oars and steering oars are not required since enclosed boats are motor-driven and have permanently installed rudders; however, carriage of oars should be encouraged as a back-up for the motor should it fail to operate (note, however, that most capsule designs will not accommodate oars);

(j) Painter (2-3/4 inch-circumference manila or equivalent, of a length three times the distance from the deck to waterline if it is usual and practical to tie off a launched boat or capsule from the deck. If not, a 100-foot minimum length is reasonable);

(k) Plug (not required on capsules without automatic drains);

(l) Rowlocks or equivalent arrangements are required only if oars are carried;

(m) An external, water-activated light similar to those on liferafts, or an additional flashlight;

(n) Two fire extinguishers and a machinery tool kit (since capsules and enclosed lifeboats are motor-propelled).

31-3-30C. LIFERAFTS, LIFEFLOATS, AND BUOYANT APPARATUS

31-30-30C(1). Recertifications. Requests for the reduction in the number of persons for which the inflatable or rigid type liferaft is certificated to carry are made because the owners do not wish to equip a raft with excessive food and water over and above the requirements for the personnel on board. In such cases, the OCMI may grant such a request if the reduced capacity of the liferaft is adequate to accommodate the personnel on board. An additional nameplate, secured in the same manner and of equivalent material as the original builder's plate, is to be affixed to the raft (both rigid and inflatable) and also to the container or case for the inflatable, showing the following information:

(a) Recertified for _______ persons;
(b) Raft serial number;

(c) Date of recertification;
(d) Port;
(e) Inspector's initials.

The COI for the vessel, or a Certificate of Inspection Amendment attached thereto, shall show the change in capacity of the rafts.

A request for an increase, back to the original number of persons for which a rigid or inflatable liferaft was approved, should be handled in a similar fashion as for a decrease in number. If the request is granted, and the capacity increased to the original number of persons for which the liferaft was approved, the additional nameplate showing the reduced capacity should be removed. In addition, the old capacity painted on the rigid type of raft shall be deleted and the new capacity substituted therefor. The COI for the vessel shall be amended to reflect the increased liferaftage carried.

No lifefloats or buoyant apparatus may be repaired or rebuilt for use on inspected vessels which do not have the original builder's nameplate affixed. This plate must contain the initials of the marine inspector who passed the equipment. Before any repair or rebuilding is undertaken on lifefloats or buoyant apparatus, they shall first be examined by a marine inspector who shall determine what work must be done to satisfactorily repair the equipment. If considered necessary, the inspector or OCMI may require the canvas wrapping to be completely removed for examination of the buoyant material. Periodic inspections shall be made as the renovation of the equipment progresses, and a final inspection made when the work is completed. Any lifefloat or buoyant apparatus requiring complete or partial recovering, or which requires renewal of the wood platform, shall have an additional nameplate affixed, which bears the following data:

REBUILT BY
(Name and Address of Company)
Date ________
Inspected by (Inspector's Initials), USCG

Lifefloats or buoyant apparatus requiring only painting, renewal of netting, lines, seine floats, etc., shall not be fitted with this additional nameplate. All materials used and procedures followed shall be in accordance with the specifications in 46 CFR 160.027 and 160.010, as applicable. When large numbers of lifefloats or buoyant apparatus are reconditioned, at least one in each lot of 25 shall be subjected to a drop test and buoyancy test as described in the applicable specification. When small lots are reconditioned, one of the items should be so tested. If, in the judgment of the inspector, the condition of the renovated equipment is such as to warrant the belief that a drop test and buoyancy test are not necessary, such tests may be dispensed with. However, if there is any reason to doubt whether any lifefloat or buoyant apparatus is suitable for the purpose intended, the inspector shall require such tests as he may deem necessary, regardless of the number of floats or buoyant apparatus involved.

See NVC 12-61 for the inspection procedures for approved-type inflatable liferafts which have been in storage for extended periods of time since manufacture or last servicing.

31-3-30C(2). Liferaft Inflation Systems. Inflatable liferafts which are Coast Guard-approved have their inflation systems tested for compliance with 46 CFR 160.051-5(c)(4) and -5(e)(11) (see NVC 2-75). These regulations require inflation systems to meet time and temperature range limitations. The method presently used for meeting these requirements is to precharge the carbon dioxide inflation cylinder with approximately 10% of nitrogen gas. This nitrogen gas is relatively unaffected by external temperature changes and will act as a catalyst to assist in releasing the carbon dioxide.

Coast Guard-approved service facilities must follow the procedures specified in the manufacturer's service recommendations for precharging cylinders. The use of nitrogen to meet this requirement is the present industrial state-of-the-art technique; the possibility exists for other methods to be used, following Coast Guard acceptance.

Uninspected vessels equipped with non Coast Guard-approved rafts, and rafts not serviced at approved facilities, may not have received a temperature-compensation precharge. This could result in a raft's under-inflation or non-inflation when put into use.

Affected industries and organizations should be made aware of this potential problem through the unit's public awareness programs (see part 8-5 of this manual).

31-3-30C(3). Substitution of Inflatable Liferafts for Lifeboats. For vessels not on an international voyage, 46 CFR 33.07, 46 CFR 75.10-25, 46 CFR 94.10-55, and 46 CFR 192.10-55 permit the substitution of inflatable liferafts in varying amounts for other types of liferafts, lifeboats, and buoyant devices. When substitutions of inflatable liferafts for lifeboats are made in accordance with the above provisions, affected vessels shall be equipped as follows:

(a) On each side of the vessel, one or more davit-launched inflatable liferafts of sufficient capacity to accommodate the total number of persons on board;

(b) A minimum of one launching device on each side of the vessel. Operation of the raft launching device shall not require anyone to remain on board. Installations shall meet the requirements outlined in 46 CFR 75.27 and 75.37;

(c) Sufficient float-free inflatable liferafts with capacity to accommodate not less than half of the total persons allowed on board. On vessels with both aft and forward accommodation spaces, the float-free rafts shall be divided between the two spaces in proportion to the number of persons normally carried at each location;

(d) On a vessel for which persons on board will have an escape route not requiring them to board inflatable liferafts by first entering the water, nor to descend to them a distance in excess of 4 1/2 meters, float-free inflatable liferafts may be substituted for the davit-launched rafts and launching equipment required by (a) and (b) above. There shall never be less than sufficient liferafts carried on either side to accommodate 100% of all persons aboard;

(e) A motor-propelled rescue boat suitable for ocean service with a davit or other suitable launching gear, capable of launch by no more than three persons, may be accepted in lieu of retaining one lifeboat for vessels of 1600 G.T. or less.

The number of inflatable liferaft launching devices installed on each vessel, and the number of liferafts assigned to each launching device, must be sufficient to put all persons on board the vessel in liferafts and in the water in not more than 30 minutes in calm weather. The rafts shall be distributed equally on each side of the vessel, and there shall never be less than one launching device per side.

The substituted inflatable liferafts shall be stowed in the immediate vicinity of the launching device, protected from weather and mechanical damage. Operation of launching devices shall not interfere with embarkation aids and emergency lighting.

The aforementioned regulations state that, for vessels of 3000 G.T. and above, all requests for substitution shall be forwarded to Commandant (G-MVI) for consideration. OCMI's should inform vessel owners/operators that the Commandant will review any request for substitution in light of these requirements.

(Note: Vessels not on an international voyage complying with the equivalent specified in section 31-3-5J are acceptable).

31-3-30C(4). Improved Cold Weather Inflation Standard Exemption. 46 CFR 94.10-5(b), 46 CFR 75.105(b), 46 CFR 33.0130(f), and 46 192.10-5(b) have been amended to require improved inflation performance for all Coast Guard-approved inflatable liferafts in service. The approvals for all rafts shown by testing not to comply with these new standards were terminated. These regulations affect all rafts manufactured prior to 1 January 1975 with approval number 160.051/49 or lower. Rafts in service were given a phase-in period for alteration or replacement. Great Lakes' vessels were to comply by 1 January 1976, and all other vessels by 1 January 1980. NVC 2-75 establishes procedures to be followed by inspectors in modifying existing rafts.

The Commandant has determined that the operating conditions or routes of some vessels would make compliance with the new requirements an unnecessary hardship. Upon request from vessel operators, OCMI's may permit continued use of existing rafts, without temperature modifications, on vessels operating under either of the following conditions:

(a) When the COI limits operation to months in which rafts will not be exposed to a minimum ambient temperature less than 32°F; or

(b) On routes limited to operation within the following geographical areas:

(i) Atlantic: below 33°N latitude and above 40°S latitude, including Puerto Rico and the Virgin Islands;

(ii) The Gulf of Mexico;
(iii) Pacific: below 39°N latitude and above 40°S latitude.

Rafts meeting either of these criteria shall be marked to indicate their acceptance without the "MOD-TEMP" alteration.

The provisions of this paragraph are also applicable to 46 CFR, Subchapter T vessels (see 46 CFR 180.10-30(c)).

Service facilities and affected vessel operators should be made aware of the details of this exemption through the unit's public awareness program (see part 8-5, Volume I of this manual).

31-3-30D. LIFE PRESERVERS

31-3-30D(1). Cork and Balsa Wood Preservers. SOLAS 60 requires a life preserver to support the head and have the ability to turn an unconscious wearer face-up in the water. Cork and balsa wood life preservers manufactured under 46 CFR 160.003 and 160.004 do not meet these requirements. All manufacture of these life preservers terminated on 1 July 1965 and all approvals for these items have been terminated.

Cork and balsa wood life preservers manufactured prior to 1 July 1965 may be placed in service or continued in use as long as such life preservers are available and in serviceable condition. These life preservers, however, may not be used on any passenger, cargo, or tank vessel built or contracted for after 26 May 1965 which is engaged in an international voyage and subject to the requirements of SOLAS 60. This type of life preserver shall no longer be permitted to be cleaned or repaired.

31-3-30D(2). Number of Preservers Required. In connection with COI's issued to tank, cargo, and miscellaneous vessels, the OCMI shall require one life preserver for each person carried, plus one additional life preserver for each person on watch in the engineroom, pilothouse, and at the bow lookout. Therefore, assuming that the total number of persons carried on a vessel is 43, and three men are carried on the watch on the bridge and three men on the watch in the machinery space, the entry on the COI shall be: "50 life preservers, adult."

31-1-30D(3). Stowage on Tank, Cargo, and Miscellaneous Vessels. The stowage of life preservers on board tank, cargo, and miscellaneous vessels shall be in accordance with applicable regulations. With respect to the stowage of additional life preservers provided for personnel on watch in the engineroom, pilothouse, and at the bow lookout, any method of stowage which reasonably meets these requirements shall be accepted. That is, such life preservers shall be stowed so as to be readily accessible to the personnel on watch.

31-3-30D(4). Stowage on Small Passenger Vessels. The stowage of life preservers on board inspected small passenger vessels shall be in accordance with 46 CFR 180.25-10. An appropriate number of these life preservers shall be stowed so as to be readily accessible to personnel at their operating stations.

31-3-30D(5). Shipboard Inspections. The inspection of a life preserver is a relatively simple procedure which does not require its destruction. A visual inspection of the life preserver shall first be made to determine its general condition. The envelope, tie straps, stitching, and lifting attachments shall be checked. If they show signs of rot or deterioration, they shall be tested with a gentle tug. Other conditions which may indicate that a life preserver is unserviceable are excessive hardness, stiffness, lumpiness, nonresilience, dirtiness, or being oilsoaked. A gentle squeeze may be used to determine most of these conditions. In addition, kapok inserts shall be checked for waterlogging and mildew odor. Excessive compression of inserts is not required because it is the natural buoyant properties of the kapok fiber, and not the sealed bag, which provides the required buoyancy. Although a sealed vinyl pad covering may provide additional buoyancy, its primary purpose is to protect the kapok fibers from waterlogging, mildewing, exposure to petroleum vapors, etc. Therefore, the inspector should not concern himself with finding small leaks in kapok inserts as long as they do not exhibit the conditions specified above. However, a ruptured kapok insert is suspect if there is evidence of moisture or oil-soaking, since oil and mildew will break down the waxy kapok fibers.

If the general condition of a life preserver indicates that its buoyancy may be questionable, representative samples should be subjected to a buoyancy test. Such tests shall be governed by the requirements of NVC 2-63. If a life preserver fails to meet the required test, and is found unfit for service and beyond repair, the inspector shall have it destroyed (rendered unfit for further use) in his presence and removed from the ship.

Minor repairs and cleaning shall be accomplished in accordance with 46 CFR 160.006 and NVC 2-63.

31-3-30D(6). Military-Type Life Jackets. The military-type jacket differs in construction from that of the commercial, Coast Guard-approved type in that it has numerous leg and collar straps, removable pads in zipper compartments, and twice the number of strap adjustments. Also, the envelope, webbing, and tie tapes are not mildew-inhibited.

The military-type jacket is not approved by the Coast Guard because factory inspections are not supervised by Coast Guard personnel; strap adjustments are more complicated; and jackets may not be constructed strictly in accordance with military specifications, due to waivers which may have been granted. Such life jackets are not generally available through commercial sources except as Government surplus equipment, and as such their true condition is questionable. For these reasons, military-type life jackets may not be used in lieu of commercial, Coast Guard-approved PFD's.

31-3-30E. EXPOSURE SUITS

Commercial vessels operating on the Great Lakes will soon be required by regulations to be equipped with an exposure (survival) suit for each crewman, passenger, and child carried plus specifically located suits near normal work stations. In anticipation of these requirements, many vessel operators have equipped their vessels with a number of exposure suits. These suits, although not presently required equipment, should be inspected during normal vessel inspection visits to ensure that the suits on board will provide the protection for which they were designed.

The following items outline the inspection procedures for each survival suit. It should be kept in mind that the purpose of the suit is to prevent hypothermia through the use of closed-cell foam insulation and the watertight integrity of the suit:

(1) Storage. An exposure suit should be kept in the container or bag provided. This bag should be inspected for punctures, broken handles, deteriorated snaps and fasteners, and seam tears. Additionally, if it is stored where wind and weather may affect the bag's condition, suitable protection should be maintained. The exterior of both the bag and weather protection should be marked with the appropriate size ("Adult" or "Child") and the words "Exposure Suit;"

(2) Removal for Inspection. The exposure suit should be removed from the bag and laid out on a flat surface to facilitate inspection. The suit should be inspected for manufacturer's name, model number, and size (when final regulations are promulgated, the words "U.S.C.G. Approval Number ____" will also appear). A visual inspection should be made to ensure that all parts of the suit are intact;

(3) Seams. Seams should be examined to ensure that no seam separation has occurred. If separation has occurred, the seam should be reglued with an adhesive specified by the manufacturer (suits are a minimum of 3/16" in thickness);

(4) Holes and Tears. If holes and/or tears are found, they should be repaired by patching in accordance with the manufacturer's instruction manual;

(5) Abrasions. The exterior coating of a suit should not be worn so as to expose the inner foam insulation. Manufacturer's instructions should be followed for repair;

(6) Boots and Mittens. These should be examined for wear. Deterioration exceeding approximately 1/2 of suit thickness should be repaired;

(7) Zippers and Snaps. Ease of operation should be determined and lubrication added as required (wax or other lubricant);

(8) Buoyancy Rings. Rings should always be attached to the suits (snaps or clasps). The manual inflation system shall be inspected and the ring inflated. No leaks should be detected;

(9) Restowage. The inspector should insure that each inspected suit is returned to its bag and properly restowed in an accessible location.

31-3-30F. DAVITS, WINCHES, AND FALLS

31-3-30F(1). Boat Falls. The Commandant has no objection to the use of nylon or polypropylene line for lifeboat falls provided that the requirements in 46 CFR 33.10-10, 46 CFR 75.33, and 46 CFR 94.33 are complied with. All installations must be made to the satisfaction of the OCMI, and it shall be demonstrated during installation tests that the operation and handling properties of the substitute line are satisfactory for the purpose. Polypropylene line is acceptable as a substitute for manila line on a size-for-size basis, except that 3" circumference polypropylene line is acceptable in lieu of 3-1/2" manila. In other instances, when a reduction in size of the substitute line is proposed, strength comparable to the original manila line shall also be required. Polypropylene and nylon line should have black or blue pigments dispersed in them when they are manufactured, to resist ultraviolet sunlight deterioration.

31-3-30F(2). Davit Stopper-Bars for Gravity Davits. A consideration of primary importance in connection with the arrangement of davit stopper-bars is that the stopper-bars should be capable of being unshipped without requiring the lifeboat to be lifted. It is important that free and unimpeded lowering from the stowed position be ensured. (Certain arrangements which have been proposed in the past may serve to reduce the likelihood of damage, due to the davits being raised against a stopper-bar in place, but these should not be used because they do not permit freeing the stopper-bar easily if the davit arm bears upon the bar.) Clips which do not permit the stopper-bars to be unshipped without lifting the lifeboat are contrary to regulations and should be removed whenever found on any ship, as an unauthorized modification to a unit of approved equipment.

Stopper-bars should be arranged so they can be cast free without having to raise the boat by handcrank or electric power. An acceptable arrangement is one wherein the stopper-bars are freed simultaneously with the gripes, as the bars pivot at one end and swing outboard parallel to the tracks when released by a lever on each davit arm.

31-3-30F(3). Fiege Wire Sockets. A "fiege" clevis socket assembly is installed by seizing the wire near the end, driving a sleeve onto the rope, unlaying the end of the rope, fanning out the strand ends, cropping the hemp core, inserting a tapered fluted plug between the strands, and driving the plug to a solid seat inside the sleeve. The strands are compressed between the plug and sleeve by the tightening action of a covering socket, after which the seizing is removed. There is an inspection hole in the side of the socket through which the wire end can be sighted to see if it is fully in place.

Close attention shall be paid to these sockets wherever found. The inspection shall include a determination as to the tightness and condition of the sleeve and a sighting of the inspection hole to see that the wire is well up into the socket. Whenever the sleeve is found to be loose or worn, the fitting should be removed and inspected and the wire cropped and socket refitted. If the sleeve is worn or distorted, it should be renewed. Care should be taken that the new sleeve is sufficiently long or has been fitted far enough back on the wire that the wire end extends to the limit of the socket cavity. The fitting should be proof-tested after installation. For further details, see the Aids to Navigation Manual--Seamanship (CG-222-2).

The use of fiege fittings is discouraged. "Poured" sockets, swaged fittings, and splicing are more reliable when done professionally and load-tested before use.

31-3-30F(4). Davit Span Wires and Manropes. Gravity and mechanical davits are required to have manropes suspended by a davit span wire. However, in the case of davits for launching enclosed lifeboats, the davit span wires and manropes may be omitted since they cannot be properly used.

31-3-30F(5). Limit Switches for Gravity Davits. 46 CFR 160.015-3(i) and (k)(2) specifically require the installation of limit switches on all gravity davits. The purpose of the limit switch is to positively stop the winch prior to the arm striking the davit, to avoid straining the falls or breaking them. The final 12 inches of travel are to be hand-cranked. Davits are approved without the limit switches since they can be marketed without power. When this occurs and power is added at the shipyard, limit switches must be included. The requirements apply regardless of the power mode for operation of the winch, installed or portable (electric, pneumatic, handy-billy, or electric/pneumatic drill).

31-3-30G. LIFEBOAT-HANDLING EQUIPMENT CASUALTIES

31-3-30G(1). Blocks. The sheave enclosures of lifeboat davits and the blocks of their falls require regular examination for evidence of corrosion and excessive sheave clearance. Such examination shall include the floating blocks and the lower part of the tackle attached to the lifeboats.

In one casualty, extensive corrosion of the steel becket strap of an upper tackle block caused the strap to part when the lifeboat was swung out for a drill. Outwardly the block appeared satisfactory; however, the strap behind a cheek plate had wasted away. Hidden corrosion of this kind can be detected only through close examination and hammer-testing.

If the clearance between a sheave and its enclosing cheek plates is excessive, an opening may exist in which the wire rope fall can become wedged. Sheaves on the davit arms and tackles should be viewed through the opening of the enclosure to determine if this condition exists.

These conditions, when disclosed, are sufficiently serious to necessitate the issuance of requirements for corrective action.

31-3-30G(2). Gravity Davits. Examination of gravity davits has revealed an incorrect coil retainer replacement which may short-circuit the master control switch, and a rearrangement of the controller wiring which may render operation of the limit switches useless. As a result, the only way that power may be removed from the hoisting motor is by opening the emergency disconnect switch. It has also been reported that trackway switches were so gummed by paint that the springs which normally return them to the open position were unable to operate; wheels on the limit switch arms were frozen with paint and rust; and rollers on the davit arms were frozen with rust. Finally, the lettering on the various switches indicating "on" and "off" positions was obliterated by paint.

Inspectors shall examine the condition of lifeboat davits and be satisfied that maintenance programs are keeping gravity davits in a safe operating condition (see 46 CFR 111.80-55 concerning main line emergency disconnect switches, master switches, and limit switches).

31-3-30G(3). Rottmer Releasing Gear. During World War II, the Globe American Corporation manufactured many 24'x8'x 3.73' steel oar- and motor-propelled lifeboats (with built-in tanks) which were fitted with Rottmer-type releasing gear. The company manufactured this gear under license and most of the lifeboats so fitted were installed on Victory-type vessels. Since that time, it is possible that some of these lifeboats may have found their way aboard other types of vessels.

The Rottmer-type releasing gear, as manufactured by the Globe American Corporation, employed the use of so-called "aluminum bronze" for the hook lock, upper guide bearing, and lower guide bearing. The particular alloy used by the manufacturer has an ultimate tensile strength of over 100,000 pounds per sq. inch but is subject to stress corrosion cracking in marine atmospheres. This cracking, although not always readily discernible, is sometimes sufficient to cause failure of the gear at low loads (i.e., with only the weight of the light boat on the hooks).

All vessels known to be fitted with 24-foot Globe American lifeboats shall have all Rottmer-type releasing gear carefully inspected at each inspection for certification. This inspection must be thorough and requires complete dismantling so that all parts of the gear may be carefully examined, particularly the hook lock and the upper and lower guide bearings. Any fracture in these items, however slight, is sufficient cause for replacement of the part. Such fractures shall not be brazed, and any part found to have been previously repaired by brazing shall be replaced.

31-3-30H. UPKEEP OF WIRE LIFEBOAT FALLS

31-3-30H(1). General. A review of casualties involving lifeboats and associated equipment investigated by the Coast Guard has revealed a number of material problem areas. Of the casualties reviewed, the failure of wire lifeboat falls accounted for more than 50 percent, and statistics show that the number of casualties involving the failure of wire lifeboat falls are increasing. The most common cause of wire fall failure is lack of maintenance in areas which, under normal conditions, are inaccessible. It has been generally discovered, after careful examination, that the falls parted at inaccessible points which are in the vicinity of sheaves and guards or where the falls remain stationary on their davit sheave. Additionally, wire falls are exposed to severe atmospheric conditions as well as frequent inundations of salt water and spray. Soot and stack gases carry corrosive elements and, when combined with abrasive materials from other sources, are additional causes of excessive deterioration and rapid corrosion of wire falls.

31-3-30H(2). Maintenance and Lubrication. Wire rope falls must be free of broken strands and damaging corrosion, and must be well lubricated with grease throughout their entire length. Particular attention should be paid to areas where the falls pass through blocks, sheaves, and other obstructed areas. On the exposed portions of the wire falls, a ship's crew can apply lubrication without lowering the lifeboats. However, in places where falls are hidden by blind sheaves or guards, the falls cannot be properly lubricated without lowering the lifeboats and exposing these sections of the wire rope. Even after lowering the lifeboats, there may be sections of the wire rope which do not move and it is not possible to lubricate the surface riding hard against the sheave. In the case of wire rope which has a fiber core, such material may become dry, absorb moisture, and cause internal corrosion.

One way to lubricate unexposed areas of the wire lifeboat falls is to lower the boat a few feet so that these critical spots are clear. Another way is to take the load off the falls and free them from the hidden areas. These portions of the wire rope should have the lubrication thoroughly worked into the strands completely around the wire rope. The best lubricants for such maintenance contain lightbodied compounds with rust inhibitors which have good penetrating properties. These lubricants can be dipped, swabbed, or sprayed onto the wire rope.

31-3-30H(3). Examinations. Lifeboat falls shall be thoroughly examined by a Coast Guard inspector at least once every two years. In this examination, the lifeboat should be cradled or stopped off and the load taken off the falls. The surface appearance of the wire rope shall be checked for wear as well as for the presence of "fishhooks" or splinters. A marlinespike may be passed between the lay of the wire and backed to expose the interior of the wire rope. Should the surface appear worn, or if there is any doubt about the condition of the falls, they shall be replaced. If the falls are deemed satisfactory for continued service but there is some question as to the proper maintenance of the falls in those areas which have been in contact with sheaves or covered by guards, the falls should be end-for-ended. However, if it is more practicable to cut a few feet from the standing end of the wire falls in order to reposition those questionable areas, the inspector may accept this method.

31-3-30H(4). Workbooks. Whenever any maintenance is performed on the lifeboat falls, such information should be recorded in the vessel's workbook. The inspector should examine these records to determine the age of the falls and whether any shipboard maintenance has been performed since the falls were last renewed.

31-3-30I. EMERGENCY EQUIPMENT FOR LIFESAVING APPARATUS

31-3-30I(1). Batteries for Lifeboat and Inflatable Liferaft Flashlights. Dry cell batteries for use in lifeboat and inflatable liferaft flashlights are required to meet the specifications of 46 CFR 161.008-5(d). Approval certificates are not issued to manufacturers of dry cells which are found to be in compliance with the specifications, but all such manufacturers are listed in the Equipment Lists. Flashlight batteries other than those listed in the Equipment Lists are not acceptable for use in lifeboat flashlights.

Flashlight batteries in lifeboats shall be replaced annually, when the lifeboats are inspected. The flashlight batteries packed in inflatable liferafts are required by 46 CFR 160.051 to be replaced when the rafts are serviced ashore annually. When it can be shown to the satisfaction of the OCMI that approved batteries are not immediately available, batteries acceptable to the inspector, after examination and testing, may be substituted on a temporary basis. This deficiency shall be noted on Form CG-835 with a requirement to obtain the proper batteries; a reasonable period of time shall be permitted to obtain them. Since batteries are normally procured well ahead of time for use on vessels, an extension of time should not be necessary each time the vessel must renew flashlight batteries.

31-3-30I(2). Batteries for Electric Floating Automatic Lights. Waterlights meeting 46 CFR 161.001 specifications have not been permitted to be installed since 31 December 1971; however, those installed before that date may continue to be used as long as they are in good condition. 46 CFR 161.001 specifies that each waterlight shall be provided with a Type BA-23 self-contained, dry cell battery manufactured in accordance with Military Specification MIL-B-18, Batteries, Dry. However, Type BA-23 batteries are not generally available through commercial sources to the manufacturers of new waterlights or to vessel owners for use as replacement batteries.

There are batteries readily available commercially which comply with Federal Specification W-B-101, Batteries and Dry Cells. Such batteries are listed on a Qualified Products List under Federal Specification W-B-1, Battery, Dry, which is revised periodically. General purpose or special-grade general purpose No. 6 dry cells listed in QPL-W-B-101 may be used as original and replacement batteries for waterlights. The following batteries are listed:

(a) General Purpose:
Bright Star No. 6 Ignition;
Usalite No. 6;

(b) Special-Grade General Purpose:
Eveready No. 6 RR;
Industrial, Burgess 4 FH.

QPL-W-B-101 may be obtained from the Business Service Centers of General Services Administration (GSA) regional offices. Batteries which are approved for use with a specific waterlight will be listed on the nameplate of the waterlight.

31-3-30J. EMERGENCY RATIONS FOR LIFESAVING APPARATUS

31-3-30J(1). Sweetened Condensed Milk. Any evidence of rusting, bulging, or rupturing of cans shall be cause for rejection.

31-3-30J(2). Canned Water. Over-age water shall not be used for lifeboat provisions on vessels which are inspected and certificated by the Coast Guard. This includes public vessels (MSC, etc.).

In 46 CFR 160.026-3(c), the term "standard aseptic procedures" means that the methods and equipment used in the processing of water should be such as to ensure that the final product is completely sterile and low in mineral salt content. The Coast Guard does not require specific types of equipment (filters, pumps, etc.) for processing water; however, most manufacturers of approved-type water have found that some sort of filter is necessary in order to meet the test requirements of the specifications.

With regard to a suitable rust inhibitor, 1 to 2 oz. of 41 degree Baume sodium silicate (alkali-silicate ratio of 1 to 3.22) per 100 gallons of water has proved to be satisfactory in most instances.

31-3-30J(3). Equivalents for Hard Bread. Provisions contained in a single hermetically-sealed container of an approved type may be accepted as equivalent to the two pounds of hard bread per person required for lifeboats and liferafts on ocean and coastwise vessels. Emergency provisions are approved under the same specification (46 CFR 160.026) that applies to emergency drinking water. The primary point of control is the container, not the food contents.

31-3-30K. DISTRESS SIGNALS

Service use of pyrotechnics and other distress signals shall be limited to a period of three years from the date of manufacture. This equipment is constructed and tested in accordance with 46 CFR 160.

31-3-30L. HYDRAULIC STARTING SYSTEMS FOR LIFEBOATS AND SURVIVAL CAPSULES.

Good safety practices require that lifesaving equipment be properly maintained and ready for immediate use. Regulations for inspected vessels require that lifeboat motors be operated for a minimum of 5 minutes, once a week (see 46 CFR 33.01-15, 33.25-20, 78.17-60, 97.15-45, and 196.15-45).

Certain motor lifeboats and survival capsules are equipped with hydraulic starting systems which store power in pressurized accumulators. Occasionally, a system leak occurs which allows an accumulator to lose pressure, rendering it ineffective for immediate use. If the leak is external and allows oil to be lost from the hydraulic system, pumping may not restore system pressure and starting of the engine becomes impossible.

Masters or persons-in-charge should routinely examine lifeboat and survival capsule hydraulic systems during the weekly fire and boat drill, to ensure that they do not contain leaks which allow accumulators to discharge. This can be done by determining that each accumulator is at full pressure at the conclusion of the engine test, and does not lose pressure between tests. A short-term check of the system can be made by bringing the accumulator up to full pressure. After several hours, there should be no noticeable loss of pressure on the pressure gauge. A minimum interval of four hours between tests is recommended, although a 24-hour interval is more effective.

Marine inspectors shall check the condition of the hydraulic systems of lifeboats and survival capsules during the course of their regular inspections.

31-3-30M. BOATS AND DAVITS NOT CREDITED AS LIFESAVING EQUIPMENT

Some vessels, by nature of their operation, carry special boats and launching equipment in addition to those required for lifesaving purposes by the applicable vessel regulations. These boats (survey launches, personnel boats, workboats, etc.) are considered subject to approval as lifesaving equipment, but should be sufficiently seaworthy for the waters in which they will be used. New boats should meet the applicable requirements of 33 CFR 183. The hull and structural components of the boat should be checked for damage and deterioration.

While not considered lifesaving equipment, use of such craft results in personnel being suspended over water on wires. The safety of this equipment must be ensured. The launching equipment and attachments for boats in this category should be checked by witnessing a 1.1 working load weight test. After the test, the boat attachments should be visually checked for cracking and distortion. Appropriate data plates on both the winch and davit should be provided for record purposes and future inspections.

31-3-35. FIRE PROTECTION EQUIPMENT

31-3-35A. GENERAL

The tests and inspections of firefighting equipment at the time of the inspection for certification are covered in detail in the vessel inspection regulations. The instructions in this subpart are intended to cover situations requiring particular attention or further explanation (see also NVC 6-72, CH-1, which provides a guide for the design and review of fixed firefighting equipment aboard merchant vessels. Note that this document specifically describes the conditions under which Halon 1301 extinguishing systems are equivalent to CO_2 systems).

For several years, small Halon 1301 systems have been approved for use on recreational boats and on uninspected vessels such as tugs and fishing vessels. The units are so marked and bear an approval No. 160.029/--/--. Halon 1301 is not a hazardous vaporizing liquid, so it is not prohibited by 40 CFR 25.30-10(e), and is approved under the provisions of 46 CFR 25.15 as equivalent to a CO_2 system required by 46 CFR 25.30-15(a). These systems should be installed in accordance with approved installation manuals which are provided by the manufacturers.

31-3-35B. EXCESS EQUIPMENT

31-3-35B(1). Inspected Vessels. For uniformity in the listing of firefighting equipment carried on inspected vessels, the COI shall show only the firefighting equipment (such as firehose, fire extinguishers, etc.) which is required by law and regulations. Excess equipment carried by a vessel shall not be listed; such listing would require excess equipment to be carried during all voyages, even though the levels of required equipment might be considerably exceeded.

However, firefighting equipment on board an inspected vessel which is in excess of that required must be of an approved type as required by 46 U.S.C. 489, must be tested at inspections, and must be kept in good operating condition.

31-3-35B(2). Uninspected Vessels. 46 CFR 25.30-5(b) requires all fire extinguishing equipment on board uninspected vessels to be of an approved type. 46 U.S.C. 489 prohibits carriage of excess non-approved equipment on inspected vessels; however, no similar prohibition exists for uninspected vessels. Because of this lack of prohibition, any excess fire-extinguishing equipment found to be non-approved may continue to be carried, provided it is kept in a ready-to-use condition, is tested at inspections, and is kept in an accessible location.

31-3-35C. PORTABLE FIRE EXTINGUISHERS

31-3-35C(1). Identification. Portable fire extinguishers are identified as approved by one of the following methods:

(a) If the UL listing manifest on the extinguisher bears its marine-type marking such as "Marine Type USCG B-1" or "Marine Type USCG Type B:C, Size II" or "Marine Type USCG Type B:C, Size I, Approval No. 162.028/EX __";

(b) If the make and model number of the extinguisher correspond to the listing under the manufacturer's name in the "Formerly Approved" section of Equipment Lists (CG-190).

Extinguishers which cannot be identified as being of an approved type, or which are of a type which had been previously accepted on a vessel-by-vessel basis, shall be removed.

31-3-35C(2). Coast Guard Approvals. Approval listings of portable fire extinguishers are no longer issued by the Coast Guard. All outstanding Commandant's Approvals of fire extinguishers were terminated on 1 January 1962. It should be noted that all fire extinguishers manufactured while Coast Guard approvals were in effect may continue to be used so long as they are in good and serviceable condition. An exception to this is the prohibited use of vaporizing liquid (carbon tetrachloride) fire extinguishers manufactured after 1 January 1962.

31-3-35C(3). Substitution of Portable Fire Extinguishers on Unmanned Tank Barges. 46 CFR 35.35-1(c) and Table 34.5010(a) require unmanned tank barges to have an appropriate number of Coast Guard-approved portable B-II extinguishers on board during transfer of cargo or operation of machinery or boilers. These extinguishers, if not permanently on board, are normally provided at such times by the accompanying tow vessel. Instances have occurred where the tow vessel lacked sufficient extinguishers to provide to the barge, and the shore facility was called upon to assist. Shore facilities are not required to maintain Coast Guard-approved extinguishers and normally use U.L.-approved ones.

OCMI's and COTP's may permit shore facilities to provide U.L.-approved extinguishers to a tank barge for the duration of the loading/unloading operation, provided that extinguishers of appropriate size are used (meeting the minimum weight requirements for a B-II) and that the facility's own protection is not adversely affected.

31-3-35D. CARBON DIOXIDE SYSTEMS FOR SMALL PASSENGER VESSELS

46 CFR 181.20-5 provides for the use of a single portable or semiportable fire extinguisher for a fixed system on small passenger vessels under certain conditions. Vessels built before 1 June 1958 were permitted to use up to two such portable extinguishers for this purpose, provided the controls were capable of discharging both units simultaneously. These existing installations shall be permitted to remain in use, provided they are maintained in good condition (see also 46 CFR 25.30 for fixed CO_2 system requirements on uninspected vessels and boats).

31-3-35E. FIREHOSE

31-3-35E(1). Markings. Questions have arisen as to the proper marking and testing of firehoses installed on merchant vessels after 1 January 1961, under the provisions of 46 CFR 34.10-10(1), 76.10-10(1)(3), and 95.10-10(1)(4). The prescribed marking consists of the words "Underwriters' Laboratories, Inc., Inspected, Rubber Lined (or Unlined) Fire Hose," followed by a serial number. These words appear on a cloth or rubber label permanently affixed to the firehose.

If firehose installed after 1 January 1961 does not bear the UL label, the vessel owner shall obtain and furnish certified copies of a test report by an independent laboratory showing that the firehose is in conformance with the appropriate specification set forth in the regulations noted above. All new or replacement firehose placed aboard a vessel after 1 January 1977 must be lined.

31-3-35E(2). Testing. Questions have arisen over the recommendations of both UL and the National Fire Protection Association (NFPA) that linen firehose never be wetted except for use at a fire. These recommendations notwithstanding, it is believed that the benefits derived from the periodic pressure tests required by regulations outweigh any harmful effects of wetting when the hose is properly dried before storing. Therefore, inspectors should caution shipboard personnel that particular care is necessary to thoroughly dry firehose after each wetting to avoid deterioration. All new hose placed aboard vessels shall be tested in accordance with the regulations at regular inspection intervals.

31-3-35E(3). Length of Hoses. UL standards call for nominal 50-ft. and 75-ft. lengths for firehoses designated as "50-ft."or "75-ft." lengths. In most cases, such hose should not be less than 48 feet in the case of 50-ft. lengths, 71 feet in the case of 75-ft. lengths. On approximately one out of every ten lengths, a UL inspector will conduct a burst test and the sample used in the burst test will be cut off and used for physical and chemical tests. However, in no case will this sample be greater than 40 inches in length.

31-3-35E(4). Defective Hoses. 46 U.S.C. 391 requires that firehose so defective as to be incapable of repair must be destroyed in the presence of the inspector.

31-3-35F. COMBINATION FIREHOSE NOZZLES

31-3-35F(1). New Installations. New installations and replacements of combination nozzles shall be of approved types, as required by 46 CFR 34.10-10, 76.10-10, and 95.10-10. The approved types are listed in the Equipment Lists. The 1-1/2 in., 4 ft. 601 applicators are intended for use with 1-1/2 in. combination nozzles in propulsion machinery spaces containing oil-fired boilers, internal combustion machinery, or oil fuel units. Because of orifice sizes on approved nozzles, neither self-cleaning line strainers nor internal strainers are required.

31-3-35F(2). Existing Installations. The combination solid-stream and water-spray firehose nozzles listed below were formerly accepted pending development and adoption of new designs. Those which were installed on vessels prior to approval of combination nozzles under specifications in 46 CFR 162.027 may be continued in use as long as they remain in good and serviceable condition. Self-cleaning line strainers are required with these nozzles, unless they are fitted with internal self-cleaning strainers. The accepted nozzles are as follows:

(a) Types SG-40 and SG-47, manufactured by the Rockwood Sprinkler Co., Worcester, Mass; and

(b) FOGNOZL 4-AN and 4-NAP, manufactured by the Akron Brass Manufacturing Co., Inc., Wooster, Ohio.

31-3-35G. FIREMAIN CUT-OUT VALVES

Regulations provide that firemain cut-out valves shall be sealed open, except when closed to prevent freezing. The regulations permitting cut-out valves and drains in the firemain were originally intended to preclude the possibility of freezing in that part of the firemain system located on weather decks. In non-freezing weather, the cut-out valves were supposed to be kept open for the efficient use of the firemain system in event of emergency. With the advent of dual-purpose ships (ships built for easy conversion to military use), the trend has been toward the use of cut-out valves to isolate or cross connect different sections of firemain installations. Therefore, a means for quickly identifying that firemain cut-out valves are maintained in an open position has become necessary.

The reasoning behind the use of the word "sealed" in the regulations was that a seal could be easily broken without the use of a key, axe, or chisel. It is felt that the use of a seal will bring to the attention of the person closing the valve that it is normally intended to remain open. In addition, it is easy to spot-check whether or not valves are open or closed. The sealing of these valves in an open position is a function of the vessel's operators. It is not intended that the valves be sealed in an open position by a Coast Guard inspector. Therefore, all inspectors shall accept seals provided by the vessel's operators to obtain the results intended by 46 CFR 76.10-10(e) and 95.10-10(e).

31-3-35H. SPRINKLING SYSTEMS

Many instances have been found where the maintenance of sprinkling systems on board vessels has been below required standards. Reports of deficiencies for various vessels' sprinkling systems show failures in every category. Electrical fittings were found corroded and shorted; mechanical items were found frozen and deteriorated; piping was found corroded, completely plugged (including the pump suction line), fractured, and air-bound; and sprinkler heads were found plugged.

On small or "excursion" vessels, the tests and examinations of the sprinkling systems shall be made during the inspection for certification. On large vessels operating on fixed schedules, such tests and inspections may be spread out over the 12-month period under conditions and schedules established by the OCMI and the vessel's owners or operators. All automatic features of a sprinkling system, whether employing wet or dry pipe systems, shall be tested and examined in order to ensure efficient operation. Each zone shall be thoroughly flushed out with fresh water for a sufficient period of time to properly clear the system of scale and sediment. The flushing discharge shall be routed through drain valves, test vents, or openings from which sprinkler heads have been removed. As many of these drain openings shall be provided as shall ensure a complete cleaning of the entire system.

The dry pipe and manually-operated sprinkling system shall be thoroughly drained after tests have been completed. Scheduled checks for accumulated water in dry systems should be made after the vessel is again put in operation. Regardless of the system type, a sufficient number of sprinkler heads shall be removed for examination of both the head and piping, with particular emphasis on dropped heads and low branch lines. The conditions found by this examination will determine to what extent additional removals should be made. After checking and examining the heads, sprinkling systems should be reassembled, inspected, and checked to ensure satisfactory operational readiness.

31-3-40. PORTABLE LIFEBOAT RADIO EQUIPMENT

31-3-40A. FCC APPROVAL

Portable lifeboat radio apparatus is required on passenger, tank, dry cargo, and oceanographic vessels only when such vessels are engaged "on an international voyage." The requirements in 46 CFR 33.15-25, 75.55-1, 94.55-1, and 192.55 were mandated by SOLAS 60. Approval of this equipment has been vested in the FCC; as in the case of installed radio equipment, such FCC-approved equipment will be considered as complying with the applicable regulations noted above.

A memorandum of understanding (MOU) has been signed by the two agencies concerning FCC inspection of portable lifeboat radio apparatus on vessels. This agreement applies to all inspected vessels, whether or not such vessels are subject to other FCC regulations.

31-3-40B. TWO-ISLAND TANK VESSELS

Portable radio apparatus for lifeboats stowed in the inside spaces of the after boat deck on a two-island tank vessel is acceptable under 46 CFR 33.15-25. This regulation permits stowage in suitable locations other than the chart room or radio room so long as the apparatus is immediately available for placement in a lifeboat. SOLAS 60 contains a specific requirement that, on tankers of 3,000 G.T. and over on which lifeboats are fitted both amidships and aft, the portable radio apparatus shall be kept in a suitable place in the vicinity of those lifeboats which are farthest removed from the ship's main transmitter. In effect, this requires stowage on the after boatdeck.

31-3-45. EMERGENCY POSITION INDICATING RADIO BEACONS

Emergency position indicating radio beacons (EPIRB's) are approved by the FCC; Class A, float-free EPIRB's are approved by the Coast Guard as well. An inspected vessel which is required to carry an EPIRB must have a Class A EPIRB mounted in a place where it can float free of the sinking vessel. A Class B EPIRB cannot be used as a required device even if it is rigged to float free.

The EPIRB battery should be checked at each inspection to ensure that it has not passed the expiration date marked on it. If the EPIRB has a test switch, it should be activated to determine if the unit will operate. If it does not have a test switch, it should be operated under electronic shielding or during the first five minutes of the hour as prescribed by 47 CFR 83.144d(4).

31-3-50. NAVIGATION EQUIPMENT

31-3-50A. SIGNAL WHISTLES AND BELLS

Specifications for sound signal appliances used on vessels are now prescribed by the 72 COLREGS. These specifications are aimed at increasing the ability of the mariner to identify targets which he cannot see, through the use of different sound characteristics for vessels of different lengths. The sound produced by most whistles is generally shrill and is accomplished by forcing a stream of air through a circumferential slot into a cylindrical chamber. The tone and sound of a bell must not be confused with that of a gong. Additionally, a "fog horn" is no longer specified as part of the signaling equipment.

The Motorboat Act of 1940, as amended, and 46 CFR 25.05 require that every motorboat of Class 1, 2, or 3 which operates in the navigable waters of the United States shall be provided with an efficient whistle or other sound-producing mechanical device as set forth in 46 CFR Table 25.05-10(b)(2).

Power-operated devices are required on boats of Class 3 and are optional for boats of Classes 1 and 2. These devices are not required to be specifically approved. It is the responsibility of the operator to ensure that his equipment complies with the applicable Rules of the Road.

Under Section 6 of the Motorboat Act of 1940, as amended, and the regulations thereunder, a boat on the rivers, harbors, and other inland waters of the United States may use a fog horn as a sound signaling device if it is capable of producing a blast of the duration and audibility required. However, boats on waters which are seaward of the demarcation lines described in 33 CFR 82 must comply with the International Rules, and a fog horn may not be substituted for the whistle required by those rules.

Whistles or other sound-producing mechanical devices powered by pressurized gases may be accepted for use on boats (including Class 3 boats which operate on rivers, harbors, or other inland waters of the United States), provided they are in proper working condition and meet the requirements of the applicable rules. A Freon-operated horn can be accepted as a power-operated horn, provided it is in proper working condition and capable of producing a blast of two seconds or more duration, audible for a distance of at least one mile.

31-3-50B. FOG GONGS

The 72 COLREGS, effective on 15 July 1977, require fog gongs on vessels of 100 meters (328 ft.) or more in length on International waters. This requirement applies to all vessels, U.S. and foreign flag, when outside the line of demarcation dividing International and Inland waters. In all cases, the sound produced by the gong shall be easily distinguished from the sound of the ship's fog bell, at an audible range equalling that of the ship's fog bell. The gong shall meet the specifications in Annex III to the COLREGS. When there is doubt about the suitability of an instrument, a demonstration shall be conducted under the supervision of the OCMI and a report shall be submitted to Commandant (G-MVI) via the chain of command.

31-3-50C. SIDE LIGHTS

See section 31-3-25B of this manual.

31-3-55. MSD'S ON INSPECTED VESSELS

31-3-55A. GENERAL

The objective of the marine sanitation device (MSD) program is to prevent the discharge of untreated or inadequately treated sewage into U.S. waters. The objective is pursued through enforcement of the requirements of Section 312 of the Federal Water Pollution Control Act, as amended. Section 312 requires the installation of an approved MSD on every vessel with an installed toilet system. Vessels without installed toilet systems are not subject to the provisions of Section 312.

MSD's are classified in three categories, each corresponding to a specified level of sewage treatment. The three categories are:

(1) Type I. A device which, under the test conditions described in 33 CFR 159.123 and 159.125, produces an effluent having a fecal coliform bacteria count not greater than 1000/100 milliliters and no visible floating solids. These systems are predominantly of the physical/chemical type (macerator/chlorinator);

(2) Type II. A device which, under the test conditions described in 33 CFR 159.126 and 159.126a, produces an effluent having a fecal coliform bacteria count not greater than 200/100 milliliters and suspended solids not greater than 150 milligrams/liter. These systems are predominantly biological (aerobic digestors) in nature;

(3) Type III. A device designed to prevent the overboard discharge of treated or untreated sewage or any waste derivative from sewage. While these types are predominantly holding tanks, included also are incineration and recirculation systems.

Only those vessels with installed toilet systems are required to have an installed, operable, and certified MSD, in the following manner:

(1) Vessels 65 feet in length and under must have a Type I, II, or III device;

(2) Vessels over 65 feet in length must have a Type II or III device. Type I devices are permitted only if:

- The construction of the vessel was begun on or after 30 January 1975 and the device was installed prior to 31 January 1980; or
- The construction of the vessel was begun before 30 January 1975 and the device was installed before 31 January 1979.

Portable systems (see section 31-3-55D) are not certified MSD's for the purposes of these regulations, and their use will not bring a vessel into compliance.

31-3-55B. CERTIFICATION

Section 312(g)(2) of the FWPCA, as amended (33 U.S.C. 1322), directs the Coast Guard to certify MSD's if the appropriate standards and regulations are met. Certification of MSD's is accomplished in accordance with 33 CFR 159. It is important to note that MSD's are "certified" and not "approved" when they comply with the regulations.

MSD's are certified by one of three methods:

(1) Label Certification. Devices manufactured after 30 January 1976 are usually certified by a label affixed to the device. This label will indicate, among other items, whether or not a device has been reviewed for use aboard inspected or uninspected vessels. The certification number on the label indicates which type of device it is, as in:

"Certification No. 159.15/xxxx/xx/I (II, III)

(2) Letter Certification. MSD's manufactured on or before 30 January 1976 and some custom-built systems may be certified under 33 CFR 159.12(c), by Coast Guard letter to the manufacturer or vessel owner. These devices were not reviewed to determine acceptance for inspected vessel installation. A copy of the certification letter must be maintained on board the vessel and available for review by the boarding officer.

(3) Automatic Certification by Regulation. Some Type III MSD's are certified without previous review by the Coast Guard. Holding tanks that store only sewage and flushwater at ambient air pressure and temperature are considered certified under 33 CFR 159.12a. Any Type III systems installed on a vessel before 30 January 1975 are considered certified under 33 CFR 159.12(b). These devices were not reviewed to determine acceptance for inspected vessel installation. No certification letter or label is necessary.

All MSD's which have been granted label certification must have met the requirements in 33 CFR 159 for sewage treatment, general construction, and personnel safety. However, unless the certification label on the device specifically states so, the unit may or may not comply with the applicable requirements of 46 CFR 50-64 (Subchapter F - Marine Engineering) and 46 CFR 110-113 (Subchapter J - Electrical Engineering). COMDTINST M16714.3, Equipment Lists, contains the list of label certified devices. General certification questions or those concerning letter or automatically certified devices should be directed to Commandant (G-MMT-3).

31-3-55C. TECHNICAL REVIEW OF EQUIPMENT

Letter-certified MSD's must be subjected to a plan review to determine compliance with the applicable sections of Subchapters F and J prior to acceptance of the device for installation aboard inspected and certificated vessels. This review should be accomplished by the field (mmt) office which is responsible for the plan review of the particular vessel designated to receive the device.

If the label on a label-certified device indicates acceptance of the unit for installation aboard inspected vessels, no further plan review of the unit itself is required prior to installation. If the label indicates that the MSD was certified initially for installation aboard only uninspected vessels, the unit, as with letter-certified devices, must receive plan review by a field (mmt) office prior to acceptance for installation aboard an inspected vessel. This plan review is in addition to other plan review which may be required for alterations to inspected vessels.

31-3-55D. INSPECTION OF MSD'S

The following information is provided to aid OCMI's in the determination of compliance with 33 CFR 159. Inspectors should be aware of all specific local operating requirements or conditions, in addition to Federal requirements.

Vessel owners/operators should be aware of the following requirements:

- Compliance with 33 CFR 159 is required for certification of vessels operating in waters of the United States;

- If a vessel is fitted with and is using a portable toilet, any fixed sanitation systems on board which are not in compliance with 33 CFR 159 must be rendered permanently inoperable (see paragraph 31-3-55D(3) below);

- The owner/operator has the responsibility of determining compliance with the requirements of other agencies which may have jurisdiction. It should be noted that State and local regulations pertaining to MSD design, manufacture, installation, and use are preempted under 33 U.S.C. 1322(f)(1). However, some states may have obtained "no discharge" determinations from EPA, which allow the state to prohibit the discharge of vessel-generated sewage in designated State waters;

- All modifications to a fixed or portable sanitation system must be accepted by the cognizant OCMI;

- Substances used in the processing of sewage which are defined as "hazardous substances" by 46 CFR 147 must be labeled and handled as such.

31-3-55D(1). Capacities. This information may be used when a commercial or private boater requests assistance from the Coast Guard in determining an appropriate MSD or holding tank capacity for a vessel. Capacities derived through the accompanying tables shall be considered as guidelines, not requirements. Each request should be individually evaluated to ensure that the vessel's size, route, service, and particular circumstances have been considered in determining a recommended capacity. A recommendation shall not be binding on the vessel owner, as no mandatory capacity requirements are contained in regulations.

(a) Flush Rate Capacities. Plate 31-3-55D(1).1 approximates the amount of water used per flush, or per day, which is required by different types of sanitation systems;

(b) Capacities of Type III (holding tank, no discharge) Systems. Plates 31-3-55D(1).2 and .3 can be used in conjunction to determine a reasonable holding tank capacity for a particular vessel.

The factors in plate 31-3-55D(1).2, multiplied by the number of crew and passengers, will approximate the amount of sewage (in gallons) produced per trip, based on the length of the trip, the system type, and the nature of the facility (crew or passenger); on the average, each person will produce 0.4 gallons of waste per day.

The factors in plate 31-3-55D(1).3, multiplied by the number of crew and passengers, will approximate the amount of "grey water" from galleys, showers, etc. (in gallons) produced per trip, based on the same criteria as plate .2.

When added together, the quantities derived from plates .2 and .3 will indicate the total amount of waste (sewage and grey water) produced on a particular vessel.

NOTE: Grey water may be treated and released or retained on board, at the owner/operator's option. If grey water is to be retained, the amount produced on the vessel must be factored and considered when the necessary capacity of the vessel's system is determined.

31-3-55D(2). Operational Considerations. The following information should be considered in evaluating which type and size of MSD will best accommodate a particular vessel and its route:

- The percentage of time that the vessel operates within the three-mile limit (the use of an MSD is not required while the vessel is beyond the territorial sea);

- The vessel's area of operation. Certain waters are designated as "no discharge" areas by EPA or local agencies. Type III (holding tanks) or portable devices are not required when a vessel operates in a no-discharge area, whether that operation is long- or short-term. However, Type III MSD's are recommended for long-term operations in a no-discharge area. Owners/operators should consult with EPA, State, and local authorities to determine whether the intended area of operation is a no-discharge area. Type III devices are not required for temporary operation (i.e., transit through) in a no-discharge area; Type I and II (flow-through) devices are permitted if adequately secured to prevent discharge of any sewage, treated or untreated;

- When operating with a flow-through device on board in a no-discharge area, that device must be adequately secured to prevent overboard discharge of sewage, treated or untreated. "Adequately secured" is defined as the installation of a physical restraint on the system to prevent discharges (e.g., closing and padlocking the seacock, use of a non-releasable wire tie, removal of the valve handle, or padlocking of the door to the head). The installation of a "Y" valve is acceptable, provided that raw sewage is discharged only while the vessel is beyond the U.S. territorial sea. A "Y" valve must be adequately secured in all U.S. waters to prevent the inadvertent or intentional discharge of raw sewage from the vessel;

- The vessel's operating schedule should determine the capacity required of the MSD. A vessel which does not operate 24 hours per day may be fitted with a system of less capacity than a vessel which is in operation around the clock;

- The flushing system may leak. A holding tank with a greater capacity may be necessary to accommodate this leakage;

- Sometime during its service life, a flow-through type system (Type I or II) may be operated in excess of the capacity specified by the manufacturer. Such overloading may result in complete loss of toilet facilities aboard the vessel, depending upon the type of system. For example, all facilities may be lost in the event that a self-contained physical chemical system is overloaded. Biological-type systems will probably back up when overloaded, also resulting in total failure of the system;

- Systems which incorporate existing standard toilets are capable of being bypassed, and in those systems overloading may not result in total loss of toilet facilities. Those systems designed for use on larger vessels (such as aerobic digestors) have sufficient retention capacity to accommodate an overload situation for longer periods of time without loss of facilities.

31-3-55D(3). Portable Systems. Portable systems do not make use of any of the vessel's installed systems (water, piping, electrical, etc.). Portable systems are not certified by the Coast Guard since they are not "installable" devices. The MSD regulations apply to all vessels with installed toilet facilities. Vessel owners wishing to avoid the expense of installing an approved, certified MSD may remove their presently installed systems, becoming no longer affected by the regulations. Only when conditions are such that total removal of the system would be impractical or unsafe may the system be rendered "permanently inoperable." This means removal of all parts of the toilet system except when removal of a particular part would be impractical or unsafe. The intent is to require complete, permanent removal of all installed, non-certified facilities on board vessels. This policy cannot be construed to permit the vessel owner to install a spectacle flange or discharge valves nor to blank off discharge lines. These methods are temporary means of preventing the overboard discharge of sewage, and by their very nature do not render a system permanently inoperable. Such minor alterations do not change the intrinsic character of the system; the reasonable conclusion is that the vessel owner intends to utilize the existing system at a later date, and therefore still has an uncertified installed system. Vessels with installed toilet systems cannot comply with 33 CFR 159, and must have certified MSD's on board unless a waiver has been specifically granted by Commandant (G-WPE). Vessels having installed toilets removed (rendered permanently unoperable) are not subject to the regulations. Portable systems may then be substituted on these vessels, although their use is not required for them under 33 CFR 159. Portable systems if used, must meet the following criteria:

- The device must be manufactured of a durable material such as molded plastic, aluminum, etc. which facilitates its removal for sewage disposal ashore. Collapsible units with disposable bags are not acceptable, due to their susceptibility to tearing and resultant discharge of sewage into the water;

- The system must be operated in accordance with the manufacturer's instructions for disposal of waste, use of chemical additives, etc;

- While the vessel is underway, the device must be securely fastened to the vessel with straps, wooden framing, or similar materials;

31-3-55D(4). Stability. Vessel stability must be considered when evaluating the installation of an MSD aboard a small passenger vessel. This is especially important for vessels which are fitted with holding tanks which, when full or partially full, add to the weight of the vessel(and, in the latter case, may add significant free-surface effect). The OCMI should consider each installation carefully and insure that the requirements of 46 CFR 179 are met.

31-3-55E. WAIVER OF REQUIREMENTS

Waivers of the requirements of 33 CFR 159 for individual vessels will be considered by Commandant (G-WPE), generally only under the condition that space and/or power constraints prevent the installation of any commercially available MSD. In the matter of holding tanks, the lack of pumpout facilities in the vessel's immediate area of operation constitutes sufficient justification not to install MSD's unless the vessel regularly travels outside U.S. territorial waters where overboard discharge of raw sewage is permitted.

Waivers are not used to grant short-term extensions of time for the installation of devices. Vessel owners requiring extension of time because of unavoidable delivery or installation delays should discuss the matter with the cognizant OCMI/COTP. If the vessel owner can justify the delay in compliance and demonstrate continuing efforts to comply, a Deficiency Letter (Form CG-835) may be issued with a Letter of Warning, and the vessel owner given a reasonable amount of time to install the system.

31-3-60. UNIQUE VESSEL EQUIPMENT AND MATERIALS

31-3-60A. GENERAL

Modern technology and automation are changing shipbuilding practices to such an extent that virtually every new vessel contains some novel feature which requires attention at certain intervals after the initial certification. Some such items are:

- Reheat boilers;
- High expansion foam systems;
- Carbon monoxide analyzers;
- Special steels; and
- Certain automated systems.

This situation is also true in the case of existing vessels which are rebuilt, converted, or modernized to a limited extent by periodic alterations. It is mandatory that information be available to the inspector which points out the existence of these features aboard each vessel, as well as the location of the proper inspection and testing information.

31-3-60B. RECORDS

A description of any unique equipment and/or materials shall be listed on each vessel's List of Equipment, Form CG-840AA or CG-840BB, as appropriate, under the "Remarks" section. For each piece of equipment or material, an appropriate entry should indicate where information may be obtained on the proper procedure for inspection and testing. The required entries shall be made when the equipment is installed, on the occasion of a new vessel's initial inspection for certification, or whenever necessary.

31-3-65. OIL POLLUTION ABATEMENT EQUIPMENT

(To be developed.)

31-3-70. POWER-DRIVEN FASTENERS

31-3-70A. GENERAL

This subpart provides information concerning use of power-driven fasteners on board commercial vessels to attach nonstructural items such as cables, cable trays, electrical fixtures, and pipe hangers to stiffeners, beams, frames, and nontight structural bulkheads.

Power-driven fasteners are essentially small-arms projectiles with stud threads on one end. These projectiles are "shot" into steel members to provide mountings similar to welded studs. Since these projectiles pierce the steel members, they may create crack-initiation sites, areas of localized corrosion, and sources of leaks. The possibility of loosening the fastener also exists, since the bond between the fastener and the structure is mechanical.

31-3-70B. RESTRICTIONS ON USE

Power-driven fasteners must not be used in areas which are sensitive to stress patterns or corrosion. The only practical way to control use of these fasteners is by granting specific approval for their use on a case-by-case basis. This can best be done when construction plans for new vessels or revised plans for existing vessels are submitted for approval.

Requests for approval of the use of power-driven fasteners in specific locations will be considered during plan review within the following guidelines:

(1) Power-actuated fasteners may be used in the following locations:

  (a) Within machinery spaces:

    (i) On main girder webs, other than primary longitudinals;
    (ii) On webs of watertight bulkhead primary stiffeners;
    (iii) On flanges and webs of beams on flats;
    (iv) On pillars;
    (v) On plating on flats.

  (b) Outside machinery spaces:

    (i) On nontight bulkheads;
    (ii) On decks other than weather decks.

(2) Power-actuated fasteners may not be used:

  (a) In side shells;
  (b) In strength decks or primary stiffeners;

(c) In tank tops;
(d) In tight bulkheads (W.T., O.T., etc.);
(e) In flanges of primary structural members;
(f) In any weather location;
(g) In webs of primary longitudinals;
(h) In pipe hangers for systems where thermal stresses are significant and hanger placement is important (e.g., high temperature);
(i) In any member whose failure would create a personnel hazard, such as a handrail or ladder;
(j) On members less than 0.25 inches thick;
(k) On members whose operating temperature is normally below 1°C;
(l) On materials other than mild steel;
(m) As grounding devices;
(n) To fabricate composite beams.

When used, power-driven fasteners shall be attached at least one inch from the edge of any member.

PLATE 31-3-55D(1).1

APPROXIMATE FLUSH RATE CAPACITIES

System Type	Capacity
Recirculating	0.1 gal per flush
Vacuum	0.3 gal
Hand Pump	0.5 gal
Electric Pump	1.0 gal
Conventional (Flushometer)	5.0 gal

PLATE 31-3-55D(1).2

YIELD OF SEWAGE (GAL.) PER TRIP BASED ON MSD TYPE

Duration	Crew/Pass.	System Type				
		Recirc	Vacuum	Manual	Elec	Conv
LONG	C	0.5	1.9	2.9	5.4	25.4
	P	0.5	1.9	2.9	5.4	25.4
MEDIUM	C	0.5	1.9	2.9	5.4	25.4
	P	0.17	1.9	1.0	1.8	8.3
SHORT	C	0.25	0.95	1.95	2.7	12.7
	P	0.25	0.5	0.7	1.35	6.35

NOTE 1: Based on approximation of all crew and passengers on board 24 hr/day.

NOTE 2: Based on approximation of crew on board 24 hr/day; two groups of passengers on board for 4 hr each (two trips per day), each passenger using head once.

NOTE 3: Based on approximation of crew on board 12 hr/day; six groups of passengers on board for 2 hr each (six trips per day), 25% of passengers using head once.

PLATE 31-3-55D(1).3

YIELD OF GREY WATER (GAL.)

Length of Trip	Crew/Pass. Use	Grey Water Factor
Long	Crew	30
	Passenger	30
Medium	Crew	30
	Passenger	15
Short	Crew	3
	Passenger	1.5

(NOTES 1-3: Same approximations as for sewage yield.)

PART 31-4 -- MISCELLANEOUS INSPECTIONS OF EQUIPMENT AND MATERIALS

31-4-1. INTRODUCTION

From time to time, Coast Guard personnel are called upon to inspect various items such as boilers, pressure vessels, equipment, and materials belonging to other Coast Guard programs and other Federal, state, and local agencies. For example, a qualified hull inspector may be requested to assist in the survey of a small boat at a Coast Guard station, or a boiler inspector may be requested to investigate a boiler casualty on a Coast Guard cutter. The Commandant desires that inspection personnel fulfill such requests as time and resources permit, to further overall marine safety. Records of inspections shall be made on the form(s) supplied by the requesting agency or on forms produced locally by the OCMI/COTP. Reports shall be made in accordance with current directives.

31-4-5. INSPECTION OF MATERIAL AND EQUIPMENT PURCHASED FOR COAST GUARD USE

31-4-5A. GENERAL

When directed by the Commandant, or when requested by competent authority, the OCMI shall supervise the inspections required on materials and equipment purchased for Coast Guard use, in accordance with a copy of the contract, purchase order, plans, or specifications furnished. It is contemplated that marine safety personnel will perform inspections of materials and equipment such as boilers, machinery, auxiliaries, related fittings, and other items of material and equipment normally inspected for use by the marine industry. The inspector shall interpret plans and specifications; when doubt or questions are raised, the matter shall be referred to the OCMI, and the Commandant (via the chain of command), if necessary.

31-4-5B. DUTIES OF THE INSPECTOR

The duties of an inspector in connection with material purchases for Coast Guard use are outlined briefly:

(1) Become familiar with the contract and specifications for the material which must be inspected and the related correspondence;

(2) Become acquainted with the flow of production and shipment of material so that progress of the work may be reported on from time to time;

(3) Assist the manufacturer, when desirable, to ensure that Coast Guard requirements are met;

(4) Report any failure of the contractor to carry out the requirements of the contract or purchase order, plans, specifications, or instructions issued.

31-4-5C. DEFINITIONS

(1) Full Coast Guard Inspection. When all of the material purchased by a contractor is inspected and tested in accordance with all of the requirements of the contract or order, applicable drawings, and specifications, such material has been given a "full Coast Guard inspection." This type of inspection will rarely be required, since it involves very close attention to the work and probably the assignment of a full-time inspector.

(2) Performance Inspection. This type of inspection may require operation under "no load" for a period as required by the specifications, or may require the load requirements of the specifications to be demonstrated under test. The specifications and purchase order will be definite with respect to these requirements.

(3) Surface Inspection. When this inspection is required, the material shall be visually examined for appearances and imperfections and critical dimensions shall be checked. No chemical analysis or physical tests need be conducted.

(4) Shipping Inspection. This inspection merely requires that materials be properly packed, marked, and in the proper quantity in accordance with specifications or shipping requirements.

CHAPTER 32 -- INSPECTION AND EXAMINATION OF FOREIGN VESSELS

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PART 32-1 -- GENERAL

32-1-1. INTRODUCTION

Certain vessel inspection laws and regulations apply to foreign vessels when they carry passengers (persons in addition to the crew), flammable or combustible liquid cargo in bulk, or certain other dangerous cargoes while navigating in waters of the United States. In addition, certain provisions of the pollution prevention and navigation safety regulations apply to foreign vessels navigating in U.S. waters. The extent of the application of these laws and regulations has been modified, in many cases, by various international conventions. This chapter explains the application of the laws, convention agreements, and regulations which apply to foreign vessels operating in waters under the jurisdiction of the United States. See Chapter 76 (Volume V) of this manual for the application of load line requirements, and Chapter 39 of this manual for pollution prevention and navigational safety requirements applicable to foreign vessels. Part 10-18 (Volume I) of this manual provides information concerning the Automated Mutual Assistance Vessel Rescue System (AMVER) and boardings under its authority.

32-1-5. IMPLEMENTATION OF THE 1974 SOLAS CONVENTION AND ITS 1978 PROTOCOL

On 25 May 1980, the 1974 International Convention for the Safety of Life at Sea (SOLAS) became binding upon the United States. The 1978 Protocol to the convention became effective 1 May 1981. While many nations are or will be abiding by these regulations, others are still operating under provisions of the 1960 SOLAS Convention. Therefore, blanket implementation of SOLAS 74 will not be realized. As a result, the Coast Guard's policy will be as follows:

- To continue to recognize SOLAS 60 certificates on vessels of nations which are parties to SOLAS 60 but not to SOLAS 74, and to recognize SOLAS 74 certificates on vessels of nations which are parties to SOLAS 74. Examinations and control verifications will be made in accordance with the regulations of the applicable convention;

- To stop issuing SOLAS 60 documents, and henceforth to issue only SOLAS 74 certificates;

- To issue the '78 Protocol Supplements to the applicable U.S.-flag vessels.

It should be noted that presently there are no definite plans by the U.S. to renounce SOLAS 60. U.S. renunciation of SOLAS 60 would require a specific bilateral treaty with every nation with whom we presently trade which is party to SOLAS 60 but not to SOLAS 74.

For U.S.-flag vessels, SOLAS 74 certificates shall be sufficient, even when calling upon nations which remain parties only to SOLAS 60 (see paragraph 32-1-20C(1)).

The supplements to the Cargo Ship Safety Construction and Equipment Certificates, Forms CG-4359A and CG-3347A, shown in the Appendix to the 1978 SOLAS Protocol may be present on some vessels beginning on 1 May 1981. Full international implementation of the '78 Protocol is not expected until 1 May 1982 at the earliest. Therefore, strict compliance regarding the supplements will not necessarily be sought until that time. See plate 8-2-10.1 (Volume I) of this manual to determine which flags should be expected to have them. These supplements shall be treated as parts of the SOLAS 74 certificates to which they apply. For the purposes of this manual, reference to SOLAS 74 includes the '78 protocol.

32-1-10. INTENT

In the examination of foreign vessels subject to the requirements of SOLAS 74, it is intended that the duplication of examinations be avoided as much as possible. Vessels subject to this convention are normally inspected regularly by their home governments and should be checked or examined only to the extent necessary to satisfy the OCMI/COTP that such vessels comply with applicable domestic regulations, and that international safety standards required by the convention are being maintained. Examinations of Canadian vessels not subject to SOLAS should be similar to those for vessels which are subject to the convention (see part 32-3).

The degree of examination control required for a vessel will vary according to its trade and manner of operation. Thus, a vessel having SOLAS 74 certificates which operates out of its home country on a regular schedule and which is subject to regular and frequent checks by the home government, should receive a minimum of examination attention. Those vessels which operate out of the home countries for extended periods with minimal opportunity for regular examinations by their home governments should be examined more carefully, especially when the primary business of the vessel is the carriage of U.S. citizens, flammable or combustible liquid cargoes in bulk, or certain other dangerous cargoes. See part 32-2 of this manual for specific guidance for conducting examinations of vessels according to service or trade.

32-1-15. DEFINITIONS

32-1-15A. INSPECTION

The term "inspection" as used in this chapter means complete inspection of certain foreign vessels and U.S.-flag vessels leading to the issuance of a Certificate of Inspection and a 1974 SOLAS Convention Certificate (Form CGHQ-968 or CG-3347, as applicable).

32-1-15B. EXAMINATION

The term "examination" as used in this chapter means:

(1) A check of a foreign-flag vessel and its equipment for the purpose of control verification as authorized by Regulation 19, Chapter I of the SOLAS Convention which leads to the issuance of Form CG-4504, Control Verification For Foreign Vessel;

(2) A check of a foreign-flag tank vessel carrying flammable or combustible liquid cargoes in bulk to ensure that it complies with all applicable international standards and U.S. regulations which leads to the issuance of a Tank Vessel Examination Letter; or

(3) A check of a foreign-flag vessel carrying bulk dangerous liquid chemicals or liquefied gases to ensure that it is in compliance with all applicable international standards and U.S. regulations which leads to the issuance of Form CG-2832A, Letter of Compliance.

It is anticipated that Forms CG-4504 (Control Verification), CG-840S-1A (Freight/Passenger Vessel Examination Letter), CG-2832A (Letter of Compliance), and the Tank Vessel Examination Letter will be consolidated and superceded by the Certificate of Compliance. This new certificate is required by the Port and Tanker Safety Act of 1978. It will be the only form required to be on board a foreign-flag merchant vessel for purposes of examination. While the form will be new, it represents only an administrative change required by law; the relevant examination requirements will remain the same. Implementation will commence in conjunction with completion of the Marine Safety Information System. Existing forms shall be used for all internal purposes until completion of the MSIS.

32-1-15C. BOARDING

The term "boarding" as used in this chapter means a visit to a vessel for any purpose other than that of conducting an inspection or examination as specified above. Visits to observe cargo transfer procedures or spot checks for compliance with applicable U.S. regulations which do not lead to the issuance of a Tank Vessel Examination Letter or a Letter of Compliance are examples of boardings.

32-1-15D. CARGO VESSEL

The term "cargo vessel" as used in this chapter includes a tank vessel.

32-1-15E. TANK VESSEL

The term "tank vessel" as used in this chapter includes vessels that carry flammable or combustible liquid cargoes in bulk and/or bulk dangerous liquid chemicals or liquefied gases.

32-1-20. REFERENCES

32-1-20A. LAWS

The primary statutes affecting the safety requirements for foreign vessels are as follows:

(1) 46 U.S.C. 86-86i - Load line requirements for signatory foreign vessels on foreign voyages (stability and safety considerations);

(2) 46 U.S.C. 88-88i - Load line requirements for non-signatory foreign vessels on coastwise voyages or voyages on the Great Lakes (stability and safety considerations);

(3) 46 U.S.C. 170 - Applies to carriage of dangerous articles and substances on foreign vessels (safety requirements);

(4) 46 U.S.C. 362 - Applies to foreign vessels carrying passengers from any port of the United States to any other place or country (safety requirements);

(5) 46 U.S.C. 367 - Makes 46 U.S.C. 362 applicable to seagoing motor vessels of 300 gross tons (G.T.) and over (safety requirements);

(6) 46 U.S.C. 390 - Applies to foreign small passenger vessels carrying more than six passengers from a port of the United States (safety requirements);

(7) 46 U.S.C. 391a - Safety requirements that apply, with certain stipulations, to all foreign vessels, regardless of tonnage, size, or manner of propulsion, whether or not carrying freight or passengers for hire, which enter the navigable waters of the United States while carrying liquid bulk cargo which is:

(a) Flammable or combustible;

(b) Oil of any kind or in any form, including but not limited to petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil; or

(c) Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act (33 U.S.C. 1321(b)(2)(A));

(d) Designated as hazardous materials under section 104 of the Hazardous Materials Transportation Act (46 U.S.C. 1803);

(8) 46 U.S.C. 404 - Requires that all foreign passenger vessels embarking passengers at and carrying them from a port of the United States be inspected and certificated or, in the case of vessels having a valid 1974 SOLAS Convention Certificate or a Canadian Certificate of Inspection, examined to see that they are in compliance with the home certificate (safety verification requirement);

(9) 46 U.S.C. 882 - Permits U.S. cargo vessels to carry a limited number of passengers without being considered a "passenger vessel" for most inspection purposes, and extends this privilege to cargo vessels of those nations which accord similar treatment to U.S. cargo vessels; and

(10) 50 U.S.C. 191 - Applies to security of vessels, harbors, and waterfront facilities. Under this law, the movement of foreign vessels may be controlled by the captain of the port (COTP). See Chapter 80, Volume VI of this manual for PWSA considerations.

32-1-20B. REGULATIONS

U.S. regulations which are applicable to foreign vessels have been consolidated in Rules and Regulations for Foreign Vessels Operating in the Navigable Waters of the United States (CG-515), with the exception of those concerned with the carriage of dangerous cargoes, found in 46 CFR 146-148 and 49 CFR 171-174.

32-1-20C. INTERNATIONAL MARITIME CONVENTIONS RELATED TO MARINE INSPECTION TO WHICH THE UNITED STATES IS A PARTY

32-1-20C(1). International Convention for the Safety of Life at Sea (SOLAS), 1974. SOLAS deals with various aspects of maritime safety, and modifies U.S. requirements as applied to foreign vessels of nations which are parties to this convention. It contains provisions with respect to:

- Construction of ships (including subdivision, stability, machinery and electrical installations, and fire protection);
- Lifesaving appliances;
- Fire extinguishing equipment;
- Radiocommunications (including radiotelegraphy and radiotelephony);
- Safety of navigation;
- Carriage of grain;
- Carriage of dangerous goods;
- Nuclear ships; and
- Surveys and certificates.

SOLAS 74 applies to all merchant ships of contracting governments engaged on international voyages, including passenger ships (carrying more than 12 passengers) of all sizes and cargo ships of 500 G.T. and more. It excludes ships of war and troopships, fishing vessels, pleasure yachts, barges, and ships navigating solely on the Great Lakes and the St. Lawrence River. Similar provisions of SOLAS 60 are binding upon vessels of nations which are parties to that convention but not to SOLAS 74. The 1978 Protocol to SOLAS 74 applies to the same types of vessels. The '78 Protocol is an effective part of SOLAS for U.S. vessels as of 1 May 1981; full international acceptance of the Protocol has yet to be realized.

32-1-20C(2). International Convention on Load Lines, 1966. This convention prescribes the minimum freeboard (or the maximum draft) to which a ship is permitted to be loaded. It applies to all merchant ships of contracting governments engaged on international voyages except ships less than 24 meters in length or 150 G.T., fishing vessels, pleasure yachts, and ships solely navigating the Great Lakes, the St. Lawrence River, the Caspian Sea, and the Plate, Parana, and Uruguay Rivers.

32-1-20C(3). International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS). These regulations prescribe the basic rules which control the behavior of vessels at sea in order to prevent collisions. They deal with such matters as:

- Lights and shapes;
- Sound signals and conduct in restricted visibility;
- Steering and sailing rules;
- Sound signals for vessels in sight of one another.

These regulations are republished in CG-169, Navigation Rules, International-Inland; CG-172, Navigation Rules, Great Lakes; and CG-184, Navigation Rules, Western Rivers.

32-1-20C(4). International Convention for the Prevention of Pollution of the Sea by Oil, 1954 (amended in 1962 and 1969). The principal object of the 1954 Convention was the protection of the seas from oil pollution. The convention prescribed certain "prohibited zones" extending to at least 50 miles from the nearest land, within which the discharge of oil or oily mixture was prohibited. The 1962 Amendments extended the application of the convention to include ships of lesser gross tonnage and also extended the zones in which the discharge of oil was prohibited. The 1969 Amendments, apart from certain practical exemptions, prohibit oil discharge through normal operations of a ship such as tank cleaning, deballasting, etc., except under the following conditions:

(a) The total quantity of oil which a tanker may discharge in any ballast voyage should not exceed 1/15,000 of the total cargo-carrying capacity of vessel;

(b) The rate at which oil may be discharged should not exceed 60 liters per nautical mile traveled by the ship; and

(c) Any oil whatsoever from the cargo spaces of a tanker should not be discharged within 50 miles from the nearest land.

The 1978 Protocol of 1978 Relating to the Convention for the Prevention of Pollution From Ships, 1973 was ratified by the U.S. on 12 August 1980. This protocol is not in force internationally. Consequently, the discharge requirements described in paragraph 32-1-20C(4) remain in effect.

32-1-20C(5). International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969. This convention affirms the right of a coastal state to take such measures on the high seas as may be necessary to prevent, mitigate, or eliminate danger to its coastline or related interests from pollution by oil or the threat thereof following a maritime casualty. The state may, however, take only such action as is necessary in the light of the pollution or threat thereof and after due consultation with appropriate interests, including, in particular, the flag state(s) of the ship(s) involved, the owners of the ship(s) or cargoes in question, and, when circumstances permit, independent experts appointed for this purpose. A coastal state which takes measures beyond those permitted under the convention is liable to pay compensation for any damage caused by such measures. The convention contains provisions for the settlement of disputes through negotiation, conciliation, and arbitration.

32-1-20C(6). International Convention for Safe Containers (CSC), 1972. This convention seeks to maintain a high level of safety of human life in the transport and handling of containers, while facilitating their international intermodal transport.

32-1-20C(7). Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972. This convention, commonly known as the London Dumping Convention, promotes the effective control of all sources of pollution of the marine environment. It especially tasks contracting parties to take all practicable steps to prevent the pollution of the sea by the dumping of waste and other matter that is liable to create hazards to human health, to harm living resources and marine life, to damage amenities, or to interfere with other legitimate uses of the sea. It prohibits the dumping of any wastes or other matter in whatever form or condition except as otherwise specified below:

(a) The dumping of wastes or other matter listed in Annex I of the convention is prohibited;

(b) The dumping of wastes or other matter listed in Annex II of the convention requires a prior special permit; and

(c) In times of emergency conditions when necessary to secure the safety of human life or of vessels, aircraft, platforms, or other man-made structures at sea.

The Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1401 et seq.) was passed on 23 October 1972 before the London Dumping Convention was convened. It was amended on 22 March 1974 (P.L. 93-254) to take into account the provisions of the convention.

32-1-20C(8). Officers' Competency Certificates Convention, 1936. Every country which is party to this convention must establish minimum requirements of professional capacity for the master, chief engineer, and navigating and engineer officers in charge of watches serving on board merchant vessels of that country (see section 32-1-25D).

32-1-20C(9). Certification of Able Seaman Convention, 1946. This convention requires a country which is party to it to ensure that persons engaged as able seamen on merchant vessels of that country are qualified to perform any duty in the deck department and hold a certificate of qualification as an able seaman granted in accordance with the provisions of the convention.

Plate 8-2-10.1 (Volume I) of this manual indicates which nations are parties to the various international conventions discussed above.

32-1-25. FLAG STATE INSPECTION PROGRAMS

32-1-25A. ANNUAL INSPECTION PROGRAM FOR PANAMANIAN REGISTERED VESSELS

The following information is provided to assist inspecting officers in evaluating vessels certificated by Panama. Note that the Coast Guard does not enforce Panamanian laws.

32-1-25A(1). General. The Republic of Panama has established an annual inspection program for its vessels, administered by the Department of Maritime Safety at the following address:

Room 920
1270 Avenue of the Americas
New York, NY 10020

The intent of the program is to ensure that:

(a) Vessels have on board all required certificates;
(b) Certificates are valid;
(c) All required equipment (lifesaving, firefighting, navigational) is on board, in good condition, and in good working order; and
(d) Vessels are properly manned for their intended service.

Examinations in conjunction with SOLAS or other IMCO requirements while a vessel is in the United States may be conducted by a classification society (e.g., ABS, Lloyd's Registry, Italian Registry) or the Panama Bureau of Shipping.

32-1-25A(2). Special Control Procedures in U.S. Ports. Whenever control of Panamanian vessels is exercised under Regulation 19 of SOLAS, or when any other problem is encountered that requires contact with an official representative of the Panamanian government, the OCMI/COTP shall notify the nearest consular office and simultaneously the Department of Maritime Safety in New York. Communications may be established by letter to the above address or by any of the following means, as appropriate:

(a) Telex Address: Safety Mar New York or Segumar 66239;

(b) Normal Telephone Number: 212-765-3304 (Mon-Fri, 0830- 1630, Eastern time). Mr. Juan de Mena is the Chief, Maritime Safety for the Department of Maritime Safety;

(c) Emergency Telephone Numbers (evenings, weekends, and holidays):
  (i) Mr. Spiros Vamas, 212-753-1343;
  (ii) Mr. Richard Deely, 914-238-3094;
  (iii) Mr. Thomas Feuillet, 212-892-0895.

32-1-25B. PANAMANIAN MANNING REQUIREMENTS

The following manning requirements for Panamanian vessels are in effect until altered by the Republic of Panama.

32-1-25B(1). Required Minimum Number of Deck Officers.

(a) No Panamanian-registered vessel, other than a passenger vessel, over 200 G.T. shall be navigated unless there are on board and in her service a duly-certificated master and one duly certificated deck officer, provided the vessel is engaged on a voyage of less than 600 miles from port of departure to port of destination.

(b) No Panamanian-registered vessel, other than a passenger vessel, over 200 G.T. shall be navigated on a voyage of more than 600 miles from port of departure to port of destination, unless there are on board and in her service a duly certificated master and two duly certificated deck officers.

(c) No Panamanian-registered passenger vessel of any tonnage shall be navigated unless there are on board and in her service a duly certificated master and three duly certificated deck officers.

32-1-25B(2). Required Minimum Number of Engineers.

(a) No Panamanian-registered vessel, other than a passenger vessel, propelled by machinery and over 200 G.T. shall be navigated on voyages of less than 600 miles from port of departure to port of destination, unless there are on board and in her service a duly certificated chief engineer and one duly certified assistant engineer.

(b) No Panamanian-registered vessel, other than a passenger vessel, propelled by machinery and over 200 G.T. shall be navigated on voyages of more than 600 miles from port of departure to port of destination, unless there are on board and in her service a duly certificated chief engineer and two duly certified assistant engineers.

(c) No Panamanian-registered passenger vessel of any tonnage and propelled by machinery shall be navigated unless there are on board and in her service one duly certificated chief engineer and three duly certificated assistant engineers.

32-1-25B(3). Required Minimum Number of Radio Operators.

(a) No Panamanian-registered cargo vessel of more than 1600 G.T. shall be navigated unless there is on board and in her service a radio officer possessing a General Certificate of Radio Communications, First or Second Class.

(b) No Panamanian-registered passenger vessel, regardless of tonnage, that is fitted with a radiotelegraph station shall be navigated unless there is on board and in her service a radio officer possessing a General Certificate of Radio Communications, First or Second Class. Additionally, the vessel shall comply with all provisions of Regulation 6, Chapter IV, part B of SOLAS 60.

(c) No Panamanian-registered cargo vessel of more than 300 G.T. but less than 1600 G.T. shall be navigated unless there is on board and in her service a duly certificated radiotelephone operator. If the vessel is fitted for radiotelegraphy, a radio officer must be carried in accordance with subparagraph (a) above.

32-1-25B(4). Required Minimum Number of Certificated Lifeboatmen and Crewmen Other than Officers.

(a) Every Panamanian-registered passenger vessel shall have for each lifeboat carried a number of certificated lifeboatmen, in accordance with the following schedule:

PRESCRIBED COMPLEMENT OF LIFEBOAT	MINIMUM NO. OF LIFEBOATMEN SHALL BE
Less than 41 persons	2
41 to 61 persons	3
62 to 85 persons	4
More than 85 persons	5

(b) No Panamanian-registered vessel propelled by machinery and over 200 G.T. shall be navigated unless there are on board and in her service sufficient certificated crewmen that the vessel is, in the opinion of the Panamanian Director General or whomsoever he shall designate, sufficiently and efficiently manned from the point of view of safety of life at sea as required by Regulation 13, Chapter V of SOLAS 60.

32-1-25B(5). General Provisions. Nothing in these requirements shall be construed so as to prevent the Panamanian Director General or whomsoever he shall designate from increasing the required number of officers for any vessel if, in his judgment, such vessel is not sufficiently manned for her safe navigation as required by Regulation 13, Chapter V of SOLAS 60.

Nothing in these requirements shall be construed so as to prevent the Panamanian Director General or whomsoever he shall designate from permitting a lesser number of officers to remain in service on a vessel if, in his judgment, special circumstances merit such a lesser number.

32-1-25C. ANNUAL AND SPECIAL INSPECTION PROGRAM FOR LIBERIAN-REGISTERED VESSELS

32-1-25C(1). General. The Republic of Liberia requires all Liberian vessels to undergo a periodic safety inspection once every 12 months except:

(a) Cargo ships of less than 500 G.T. engaged solely in the West African trade;
(b) Unmanned vessels and vessels not propelled by mechanical means;
(c) Pleasure yachts not engaged in the carriage of passengers for hire; and
(d) Fishing vessels.

Vessels subject to periodic inspections may also be required to undergo special inspections whenever the Commissioner of Maritime Affairs, a Deputy Commissioner, or another person duly authorized by one of them has reason to believe that a vessel is about to proceed to sea and be navigated as a consequence of which the safety of the ship; its officers, crew, and passengers (if any); and its cargo may be placed in jeopardy in the course of the intended voyage. Inspections are conducted under the direction of the Marine Inspection Division of the Marine Safety Department, Office of the Deputy Commissioner through its duly appointed nautical inspectors at major ports. The scope of the annual safety inspections include:

(a) Examination and verification of required documents, certificates, publications, charts, log books, etc.;

(b) Examination and verification of licenses of competency, both Liberian and foreign, for each officer serving on board and, in the case of passenger ships, the certification of each lifeboatman;

(c) Spot checks of lifesaving and firefighting equipment and general safety conditions covered by SOLAS 74 for the purpose of noting the degree of maintenance of conditions (but not in lieu of surveys by the classification society); and

(d) Emergency drills.

32-1-25C(2). Special Control Procedures in U.S. Ports. Whenever control of Liberian vessels is exercised under Regulation 19 of SOLAS, or when any other problem is encountered which requires contact with an official representative of the Liberian Government, the OCMI/COTP shall notify the Bureau of Maritime Affairs, Marine Safety Department, in Reston, VA, in lieu of the nearest consular office as discussed in section 32-2-20C and subpart 32-2-45.

Communications may be established by letter to Liberian Services Inc., 11800 Sunrise Valley Drive, Reston, VA 22091 or by one of the following means, as appropriate:

(a) Telex address: 81-9197 (LIBMARAD)
Marine Safety Department
Liberian Services
International Center, 11800 Sunrise Valley Drive,
Reston, VA 22091.

(b) Normal telephone number: 703-620-4880
(Mon-Fri, 0830-1630, Eastern time).

(c) Emergency telephone number: 703-620-4766
(Evenings, weekends, and holidays).
Note: This is an answering service
which will contact the duty officer
upon request.

32-1-30. INSPECTION DECISIONS AND OPINIONS

32-1-30A. FOREIGN SEAGOING BARGES

Inquiries have been received by the Commandant concerning the inspection of Canadian cargo barges which operate between Canada and various ports in southeastern Alaska. The Act of May 28, 1908, as amended (46 U.S.C. 395-398) does not apply to foreign cargo barges and there are no reciprocal agreements between the United States and Canada in regard to the inspection of such barges. Thus, foreign seagoing cargo barges are not subject to inspection and certification. However, they may be subject to load line requirements, and may be subject further to inspection requirements if carrying flammable or combustible liquid cargoes in bulk, other dangerous cargoes, or present a threat to life, property, or waters of the U.S. Foreign tank barges carrying hazardous liquids and liquefied gases in bulk fall under the provisions of the Coast Guard's Letter of Compliance (LOC) program (see subpart 32-2-10 for information concerning the LOC program).

32-1-30B. UNSAFE CARGO GEAR ON FOREIGN VESSELS

Inquiries have been received by the Commandant concerning the Coast Guard authority and responsibility for correcting unsafe conditions with respect to cargo gear of foreign-flag vessels when the information is brought to the attention of the inspector. Such conditions are now subject to U.S. Department of Labor codes; relevant information should be transmitted to that department, whose authority stems from stevedores' and dock owners' eligibility for OSHA jurisdiction.

32-1-30C. MANNING ON FOREIGN VESSELS

Regulation 13, Chapter V of SOLAS imposes an obligation on parties to the convention to ensure that their vessels are sufficiently manned from the point of view of safety of life at sea. While there are, at present, no precise manning standards which may be applied to foreign-flag vessels in every case, the following general guidelines may be utilized in taking action under the Ports and Waterways Safety Act to ensure that operations and movements in U.S. waters will be conducted safely:

(1) Normally, no foreign-flag vessel of more than 1600 G.T. entering U.S. ports should be manned with fewer than the following licensed officers: one Master, two Mates, one Chief Engineer, and one Assistant Engineer; and

(2) All licenses must be current and appropriate as to route, tonnage, horsepower, etc., and be issued by the administration of the country of vessel registry or by a nation party to the applicable convention.

For vessels of Panamanian registry, see section 32-1-20B.

A vessel manned other than in accordance with these guidelines need not, in every case, be subjected to restriction on its operations or movement; however, care should be exercised to ensure that any proposed operation or movement can be safely conducted. If, in the judgment of the COTP, a proposed operation or movement cannot be safely conducted without some changes in the vessel's manning, consideration should be given to imposition of restrictions under 33 CFR 160 and other related regulations.

32-1-30D. PORT ENTRY SURVEYS CONDUCTED BY CLASSIFICATION SOCIETIES

The Port and Tanker Safety Act of 1978 provides for port entry examinations of vessels. The title "Port Entry Exam" is an administrative name change to describe the various examinations which the Coast Guard presently conducts on board foreign vessels. Accordingly, the Coast Guard has agreed to consider surveys conducted by exclusive surveyors of certain full members of the International Association of Classification Societies (IACS), to help fulfill the examination requirement.

These surveys are on behalf of and at the sole expense of the owner. These surveys will not be conducted on behalf of the Coast Guard, and no contractual arrangement exists or is intended with respect to these surveys. The degree of reliance placed on the survey is to be determined by the cognizant OCMI. Any discrepancies between the survey and the actual condition of the vessel shall be reported to Commandant (G-MVI), noting the name of the vessel, the classification society performing the survey, the date of the survey, and the nature of the discrepancies. Survey reports will be retained on board the respective vessel. Classification societies whose surveys will be considered include:

- American Bureau of Shipping;
- Lloyd's Registry of Shipping;
- Det Norske Veritas;
- Bureau Veritas;
- Germanischer Lloyd;

- Registro Italiano Navale;
- Nippon Kaiji Kyokai.

It should be noted that this program applies to vessels registered in nations which may or may not be parties to SOLAS or other agreements. Therefore, the OCMI should note the vessel's flag state and its status with these conventions prior to deciding upon the degree of reliability placed on the classification society survey. For example, a vessel without SOLAS certificates should be examined more carefully than a vessel having current valid certificates (see plate 8-2-10.1, Volume I of this manual).

32-1-30E. HIGH VELOCITY PRESSURE/VACUUM VALVES

For high velocity P/V valves installed on board tankers, the requirements in 46 CFR 162.017-3(n) have been interpreted to allow this type of valve without a flame screen on the pressure discharge side. All other openings to atmosphere on such valves must have flame screens as prescribed in the regulations. There is no relaxation of the flame screen requirement for P/V valves not of the high velocity type. This interpretation has been made because:

(1) High vapor velocities in the pressure discharge piping preclude the passage of a flame, thus making the flame screen unnecessary; and

(2) Installation of a flame screen would defeat the purpose of a high velocity P/V valve by retarding the flow of vapor to the atmosphere.

Vessels must have on board evidence of acceptance of the high velocity P/V valve by both the administration and its recognized classification society. These valves shall be properly maintained and in good serviceable condition at all times.

32-1-35. STEERING GEAR EXAMINATIONS

Steering gear casualties on all classes of foreign-flag vessels have caused serious marine casualties and pollution incidents in U.S. waters. Under the authority of the Port and Tanker Safety Act of 1978, the steering gear on all classes of foreign-flag vessels shall be examined at least annually, and at any time the OCMI/COTP has reason to believe that the steering gear may be deficient. This examination shall be performed by qualified marine inspectors in conjunction with the overall law enforcement boarding/examination applicable to a vessel's class, service, and status.

The scope of the examination should be primarily the witnessing of an operational test and condition survey as follows:

(a) Areas to be tested are: the ship's main steering gear; the auxiliary steering gear; each remote steering gear control system; each steering position located on the navigating bridge; the main steering gear from the emergency power supply; each rudder angle indicator in relation to the actual position of the rudder; each remote steering gear control system power failure alarm; and each steering gear power unit failure alarm.

(b) Tests shall include the full movement of the rudder according to the required capabilities of the steering gear; the operation of the means of communication between the navigating bridge and the steering gear compartment; and a visual inspection of the steering gear and its connecting linkage. The inspector should be alert to any indication of potential failure, such as excessive leakage of hydraulic fluid, looseness in connections, fasteners, or couplings, frayed electrical wiring or evidence of arcing, unusual noises during operation, or evidence of insufficient maintenance (including jury-rigged repairs, painted-over lube fittings, and deficient housekeeping that might adversely affect operation of the steering gear).

(c) Deficiencies not corrected prior to continued navigation in U.S. waters should be dealt with under the control provisions of Regulation 19 of SOLAS, the Ports and Waterways Safety Act, and the regulations promulgated thereunder.

Results of these examinations shall be entered into the Marine Safety Information System (MSIS).

32-1-40. GALLEY EXHAUST DUCTS

See section 30-6-75H of this manual for guidance on inspection of this equipment.

PART 32-2--VESSELS OF FOREIGN COUNTRIES WHICH ARE PARTIES TO SOLAS

32-2-1. GENERAL

Mechanically propelled passenger ships and mechanically propelled cargo and tankships of 500 G.T. or over, which are engaged on international voyages and registered in countries which are parties to the 1974 or 1960 SOLAS Convention, are subject to the requirements of the applicable SOLAS convention. For the purposes of SOLAS 74, a passenger ship is defined as a ship that carries more than 12 passengers. A cargo ship is defined as any ship which is not a "passenger ship". A tanker is also a cargo ship, by definition. When foreign vessels are in possession of valid SOLAS certificates issued by their administrations, they shall be entitled to the privileges prescribed therein when operating on waters subject to the jurisdiction of the United States (see subpart 32-1-5 of this manual).

32-2-5. EXAMINATION PROGRAMS

32-2-5A. PASSENGER VESSELS

Passenger vessels carrying passengers from U.S. ports shall be examined at their first port of call in the United States. Previously required quarterly re-examinations may be conducted at the discretion of the OCMI. When such vessels operate on routes between several U.S. ports and under the jurisdiction of more than one OCMI, they shall be examined in the various ports to the extent necessary to ensure that each vessel and its equipment is examined at least annually. A check of the vessel's SOLAS certificates shall normally be included in such examinations.

32-2-5B. CARGO VESSELS

32-2-5B(1). General. All cargo vessels of countries which are parties to either SOLAS 60 or 74 must have on board a valid Cargo Ship Safety Construction Certificate and a Cargo Ship Safety Equipment Certificate in addition to any other required papers. These vessels should be examined at their first U.S. port of call and re-examined as deemed appropriate by the OCMI/COTP. Re-examinations shall occur at least biennially for non-tankers.

32-2-5B(2). All cargo vessels of countries which are parties to SOLAS 60 or 74 and which embark and carry from 1-12 persons in addition to the crew from a port of the United States shall be examined prior to embarking passengers in the United States. This examination shall normally be conducted biennially. All cargo vessels having on board a valid Form CG-4504, Control Verification For Foreign Vessel, need not be re-examined, unless there are clear grounds for believing that the condition of the vessel or its equipment does not correspond substantially with the particulars of its valid SOLAS certificates.

32-2-5B(3). Freight/Passenger Vessel Examination Letters. The masters of foreign-flag freight and passenger vessels which are examined for compliance with 33 CFR 155, 156, 159, and 164 in accordance with the policy outlined in Chapters 36 and 39 of this manual shall be issued a Freight/ Passenger Vessel

Examination Letter, Form CG-840S-1A (SN 7530-01-GF2-8880) with an attached Freight/Passenger Vessel Enclosure, Form CG-840S-2A (SN 7530-01-GF2-8890), when applicable. A copy shall be forwarded to the owner or operator, and a copy shall be retained by the issuing office (see paragraph 32-1-10B(4)).

The central file of examination letters previously maintained by the National Response Center, Commandant (G-WER-6), has been discontinued. To obtain current information regarding boardings and examinations conducted on foreign-flag freight and passenger vessels, the Marine Safety Information System (MSIS) should be queried in accordance with current procedures.

32-2-5C. TANK VESSEL SAFETY EXAMINATION PROGRAM

32-2-5C(1). General. Each foreign-flag tank vessel shall undergo a full safety examination at least annually with partial re-examinations conducted as necessary to ensure the correction of outstanding deficiencies. Such examinations shall be conducted in accordance with the inspection policy outlined in subpart 30-1-15 of this manual. The scope of a full safety examination ensures that each foreign-flag tank vessel entering U.S. waters complies with the general safety control provisions of SOLAS 74, the '78 Protocol, or 60, as applicable; the applicable International Load Line Convention (1930 or 1966); and all applicable U.S. regulations. Each examination shall be conducted by at least two Coast Guard personnel (normally, a qualified marine inspector and a qualified dangerous cargoman/pollution boarding officer; assistant marine inspectors may be used in lieu of the latter). Inspectors shall utilize sections II and III of the Tankship Hull Inspection Book, Form CG-840S, as a guide during the course of the full tankship safety examination. This booklet should not be construed as restrictive or all-inclusive.

The foreign-flag tank vessel safety examination program must be standardized throughout the Coast Guard to be effectively administered and to ensure that every examination is conducted consistently. The examination of foreign-flag vessels for compliance with the pollution prevention regulations in 33 CFR 155-156 shall be continued in accordance with Chapters 36 and 39 of this manual; the issuance of a "Letter of Compliance" under the regulations in 46 CFR 153-154 shall be conducted in accordance with subpart 32-2-10 of this manual; and routine boardings conducted to monitor cargo transfer operations shall be continued in accordance with existing program standards. The examination of foreign-flag tank vessels to ensure compliance with all applicable U.S. regulations will be conducted in conjunction with tanker safety examinations.

32-2-5C(2). Tank Vessel Examination Letters. At the completion of each examination of a tank vessel (either full or partial), a Tank Vessel Examination Letter, Form CG-840S-1 (with an attached Tank Vessel Enclosure, Form CG-840S2, when applicable) shall be issued to the vessel's master with copies sent to the owner/operator and Commandant (G-MVI) and a copy retained by the issuing office. At the successful completion of a full tank vessel safety examination, the Tank Vessel Examination Letter shall be issued with the following endorsement: "A full tank vessel safety examination has been completed as required by Section 5 of the Port and Tanker Safety Act (PTSA) of 1978 and the vessel is considered safe for the carriage of (grade of cargo)." The letter shall be issued for a maximum period of one year with the expiration date recorded on the letter.

When a subsequent partial examination is conducted during the period of validity of the aforementioned letter, for whatever purpose, a new Tank Vessel Examination Letter shall be issued with an appropriate endorsement to clearly indicate the scope and purpose of the partial examination (e.g., "Deficiency followup examination" or "Partial examination as indicated"). These letters shall be assigned the same expiration date as the original Tank Vessel Examination Letter.

32-2-5C(3). Deficiencies. Deficiencies required to be corrected (temporarily or permanently) while a tank vessel is in a U.S. port are those which pose an imminent threat to the safety of the port, crew, vessel, or environment. Depending upon the nature of the deficiency, correction may be required prior to cargo transfer, or transfer may be permitted to proceed with corrective action required prior to the vessel's departure. The OCMI shall indicate the date (month and year) by which a deficiency should be permanently corrected. In making this determination, every effort should be made to consult with the master to ensure that a reasonable and equitable time period is allotted. However, the maximum time allowed for permanent correction of any deficiency shall not exceed one year. Notification for such requirements is accomplished by the issuance of the Tank Vessel Examination Letter with the attached enclosure specifying the deficiencies and the dates by which they must be corrected.

Deficiencies required to be permanently corrected prior to a tank vessel reentering a U.S. port are those which have been allotted a specific time period to make permanent repairs. A vessel with a recorded deficiency must be boarded at the first U.S. port of call after the date for correction of that deficiency. Depending upon the nature of the deficiency, consideration should be given to conducting this boarding at anchorage or at the sea buoy, rather than at the transfer terminal. If permanent repairs have not been made in the allotted time, a re-evaluation of the temporary repairs shall be made to determine if the time limit for permanently correcting the deficiency can be safely extended. The procedures outlined in section 30-2-10F of this manual shall be followed in such circumstances.

If an extension of the time period for permanent repairs is not granted, the vessel must have a Report of Violation submitted on it, or be detained or denied entry as outlined in this section.

32-2-5C(4). Violation of U.S. Regulations. In those cases where foreign-flag tank vessels have deficiencies which are violations of U.S. regulations, all reasonable efforts shall be made to require permanent correction of the deficiencies immediately. Those deficiencies not required to be permanently corrected shall be appropriately recorded on the Tank Vessel Examination Letter. All foreign-flag tank vessels which have been previously examined and subsequently are found not to comply with the regulations, after prior compliance at a previous examination or after expiration of any delay in correction, shall be cited.

32-2-5C(5). Denial of Entry. The Ports and Waterways Safety Act (33 U.S.C. 1228 and 1232) provides authority to deny entry into the navigable waters of the U.S. of a tankship which does not comply with applicable provisions of the Tank Vessel Act (46 U.S.C. 391a), the PWSA itself, or regulations issued thereunder. The COTP has been delegated this authority by 33 CFR 160.111 and 160.116, and may exercise it when non-compliance constitutes a hazard to the environment or the safety of the port. When the COTP determines that a vessel does not comply with applicable regulations, he may notify the master or agent that entry into U.S. waters is denied until the vessel complies with those regulations. 33 U.S.C. 1228 provides for several conditions upon which tank vessels may be denied entry, and for a mechanism to allow provisional entry for vessels not in compliance. Guidance in this area, in the form of a Notice of Proposed Rulemaking, was published on 11 June 1981 (46 FR 30835). Except to the extent that 33 CFR 160.111 and 160.116 apply, the Commandant has not delegated his authority under 33 U.S.C. 1228.

32-2-5C(6). Vessel Traffic Management. The Ports and Waterways Safety Act and 33 CFR 160.111 provide authority for the COTP to direct, control, or restrict the movement of any vessel in the navigable waters of the U.S. for safety reasons. They also provide the authority for the COTP to order a vessel to depart U.S. waters when a hazardous condition results from non-compliance with applicable regulations. This authority provides the COTP with an effective tool to direct, control, or restrict the movements of a foreign-flag tank vessel when a hazardous circumstance exists. The hazardous circumstance must always be weighed against the welfare of the vessel's crew in exercising this authority.

32-2-5C(7). Intervention. Regulation 19, Chapter I of SOLAS authorizes enforcement officers of nations which are parties to the convention to intervene in cases where the condition of a ship subject to SOLAS may present a danger to passengers or crew if it is permitted to sail. Accordingly, OCMI's should not hesitate to intervene in cases where such a vessel does not materially comply with its SOLAS certificates and thereby poses a threat to passengers or crew if it sails. Coordination between the OCMI and the COTP (in non-consolidated ports) is mandatory in each instance of intervention or control.

32-2-5C(8). Procedures. The guidelines outlined in subpart 32-2-45 shall be followed when deficiencies which could result in the restriction of the operation or movement of a foreign-flag tank vessel are detected, whether the authority for such action is Regulation 19 of SOLAS, the PWSA, or 33 CFR 160.

32-2-5C(9). Administration. A complete Marine Safety Information System (MSIS), designed to more fully meet the information requirements of marine safety programs, has been implemented to meet the requirements imposed by the Presidential Message of 17 March 1977. It is essential that the MSIS in its present form be properly utilized. Units having MSIS access shall obtain violation histories, casualty histories, and boarding and examination information as deemed necessary prior to the arrival of each foreign-flag tank vessel. Results of each foreign-flag tank vessel examination will be entered into the MSIS in a timely manner and in accordance with the MSIS User's Guide.

32-2-10. THE LETTER OF COMPLIANCE PROGRAM

32-2-10A. GENERAL

A Letter of Compliance (LOC) is required for foreign vessels carrying bulk dangerous liquid chemicals and liquefied gases in U.S. ports. These vessels and their cargoes pose a potential unusual risk to the safety of U.S. ports and therefore require measures of control beyond those provided by SOLAS. To obtain a Letter of Compliance, a vessel's plans must be reviewed to determine if the vessel complies with U.S. regulations for cargo containment and related safety systems. Alternatively, a valid IMCO Certificate of Fitness, issued in accordance with (a) the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Resolution A.328(IX), as amended), or (b) the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (Resolution A.212(VII), as amended) may be accepted by the Commandant as evidence that the vessel is in compliance with international standards approximating Coast Guard regulations. After a satisfactory vessel examination at the vessel's first U.S. port of call, a LOC is issued which is valid for a period not to exceed two years. Attached to the LOC is a Cargoes and Restrictions List, which identifies the compliance cargoes which the vessel may carry and any special restrictions on the vessel's operation. Possession of a valid LOC notwithstanding, the final determination of whether or not a vessel may transfer a given cargo rests with the OCMI/COTP.

32-2-10B. SCHEDULING LOC EXAMINATIONS

When plan review has been completed or an IMCO Certificate of Fitness accepted for a vessel, the owner shall request a Letter of Compliance examination by contacting Commandant (G-MHM). The examination request shall include the vessel name, first U.S. port of call, date of arrival, local agent's name and telephone number, and any compliance cargoes on board. Vessel owners will be advised that any request received less than fourteen days in advance of the vessel's arrival may result in a delay in conducting the examination. The Commandant will notify the cognizant OCMI/ COTP of the examination request by letter or message and will forward an "examination set" consisting of the vessel's plans and correspondence file. For examinations for issuance of an LOC, the Commandant will also provide a local field unit with a completed Cargoes and Restrictions List. Additional information concerning peculiar vessel characteristics, restrictions, or outstanding deficiencies from previous examinations will also be included. The final arrangements for the date and time of the examination are made by the local field unit directly with the vessel's local agent.

Biennial examinations for reissuance of an LOC are arranged in the same manner as for the initial LOC examination. Special examinations to inspect vessel modifications and repairs, or examinations incident to amending the Cargoes and Restrictions List, are normally arranged by Commandant (G-MHM). Applicable information and a written request for the examination will be forwarded to the local field unit. Again, final arrangements for the date and time of the examinations are at the discretion of the local field unit.

Before conducting an LOC examination, the OCMI/COTP should allow adequate time for review of the plans and correspondence which have been supplied by the Commandant. When the vessel owner has provided a short notice of arrival, the time necessary to conduct a thorough examination should not be sacrificed to meet the owner's requested examination date.

32-2-10C. SCOPE OF THE LOC EXAMINATION

32-2-10C(1). Initial Examinations. Before conducting an initial LOC examination, the inspectors should familiarize themselves with the vessel's correspondence file and plans. Particular attention should be given to any irregularities noted during plan review. Any questions should be resolved before the examination by contacting Commandant (G-MHM). The purpose of the initial examination is to ensure that the vessel is constructed and equipped in accordance with the approved plans and applicable regulations. A vessel having a valid IMCO Certificate of Fitness must comply with any restrictions on that certificate and the provisions of the applicable code entered on the certificate.

Vessels having IMCO certificates may differ slightly from those governed by applicable Coast Guard regulations, due to minor differences in interpretation of the code's requirements by the flag administration. Inspectors shall examine IMCO vessels for compliance with the appropriate IMCO code. Coast Guard regulations adopting IMCO codes should be consulted only if clarification of the intent of a particular requirement is necessary. Commandant (G-MHM) should be consulted if gross deviations from the Code or corresponding Coast Guard regulations are detected.

The examination for issuance of an LOC shall encompass, as a minimum, Sections II, III, and IV of the Tankship Hull Inspection Book (booklet Form CG-840S). The booklet shall be used as a guide and not considered restrictive or all-inclusive. Since Section IV (Vessels Carrying Hazardous Liquids) is applicable to both chemical tankships and liquefied gas carriers, all entries may not apply to the particular vessel being examined. Entries in the booklet shall be complete and legible.

Vessel certificates listed on the inside cover of the Tankship Hull Inspection Book shall be examined for validity, and the appropriate information shall be entered in the booklet. The IMCO Certificate, which is required to be carried on board the vessel, should be identical to the copy in the vessel correspondence file.

32-2-10C(2). Reexaminations And Routine Safety Boardings. A Letter of Compliance is valid for a period of two years from the date of the last examination for issuance. Prior to re-issuance of a Letter of Compliance, a reexamination of the vessel is required. The scope of the reexamination is the same as that of the initial examination described in paragraph (1) above.

During a reexamination or routine safety boarding, the vessel's master should produce the Letter of Compliance with the attached Cargoes and Restrictions List. The inspector shall:

- Check the Examination Record for outstanding deficiencies;
- Ascertain that all required SOLAS, load line, and IMCO Certificates are valid and current;
- Check the cargo manifest against the cargoes authorized by the LOC (on vessels with IMCO Certificates, the Cargoes and Restrictions List of the LOC will refer to the list of cargoes in the IMCO Certificate and may restrict carriage of certain listed cargoes);

- Ensure that any special operating instructions listed in the Cargoes and Restrictions List or the IMCO Certificate are being observed;

- Check the cargo location plan for compatibility of adjacent cargoes or cargoes in tanks joined by common piping or vent headers (see 46 CFR 150, Compatibility of Cargoes and Operational Requirements for Bulk Liquid Hazardous Waste Cargoes). If the master claims an authorized exception to the regulations, written evidence should be produced; alternatively, Commandant (G-MHM) may be called for verification;

- Determine if dry chemical or carbon dioxide firefighting systems have been serviced within the last two years.

During routine safety boardings of liquefied gas carriers, the inspector shall also check:

- Operation of gas detection equipment and alarms;
- Temperatures, pressures, gas or oxygen accumulation in interbarrier and/or hold spaces;
- Seals and general condition of cargo tank relief valves;
- Condition of firefighting equipment and systems;
- Operation of quick-closing valves;
- Cargo tank high-level alarms; and
- Record of inert-gas consumption on loaded voyages.

The frequency at which LOC vessels are boarded is left to the discretion of the cognizant COTP. As a minimum, however, the status of all vessels entering the port which are carrying bulk dangerous cargoes should be ascertained. The status of a vessel's LOC should be checked by querying the Marine Safety Information System (MSIS). A second source of information which may be used is enclosure (2) to COMDTINST 16616.2 (series), List of Vessels With Cargo Codes. This instruction provides a list of vessels holding LOC's and is periodically updated by COMDTNOTES in the 16616 series.

Both the MSIS and COMDTINST 16616.2 (series) provide a list of authorized cargoes, the date of last LOC examination, the LOC expiration date, and the expiration dates for those valid Letters of Compliance. In the event a particular vessel does not appear in either source, Commandant (G-MHM) should be contacted to determine the vessel's status.

32-2-10C(3). Annual Tank Vessel Safety Examinations. The safety examination program outlined in section 32-2-5C of this manual should be conducted in conjunction with each initial examination and re-examination for issuance of a Letter of Compliance. These administrative procedures and guidelines apply in all cases, except that a Tank Vessel Examination Letter shall not be issued to vessels possessing a valid LOC. The Letter of Compliance (Form CG-2832A) shall be the only Coast Guard document issued to vessels in this category. Compliance with the foreign flag tank vessel requirements, however, is verified annually (i.e., on or about one year from the last LOC examination). Examination results shall be entered in the Examination Record, as outlined in section 32-2-10G below. A message report of the examination shall be submitted to Commandant (G-MHM). This report shall also include a description of deficiencies found.

32-2-10D. DEFICIENCIES

The appropriate action to be taken when deficiencies are noted during an examination or boarding is influenced by many factors. Local weather conditions, cargoes carried or transferred, crew competence, past safety record of the vessel in the port, the vessel's overall material condition, port configuration, etc., are examples of conditions which the COTP must consider when determining the hazards that certain vessel deficiencies pose to port safety. Ultimately, the proper decision will depend on the judgment, experience, and discretion of local Coast Guard personnel.

There are several options open to the COTP when making decisions of this nature. One approach is to handle each case individually as the situation presents itself. Another approach is to predetermine the relative hazards that specific deficiencies pose to port safety. The latter option entails the establishment of guidelines or solutions to certain predictable situations before they occur. This approach is especially desirable in ports where hazardous cargoes are moved on a frequent basis.

One example of this latter approach is to classify deficiencies into three distinct categories. CATEGORY ONE discrepancies are those requiring corrective action prior to port entry or, if the vessel is already in port, prior to cargo transfer. CATEGORY TWO discrepancies are those which should be corrected prior to cargo transfer but which may remain uncorrected provided special operating conditions are met. CATEGORY THREE discrepancies are those which do not need immediate correction. A few examples of discrepancies falling within these categories are as follows:

CATEGORY ONE:

(1) Incompatible cargoes stowed in adjacent tanks;

(2) Cargoes being carried which are not authorized by the Letter of Compliance;

(3) Cargo leaks from tanks or piping systems;

(4) Gas detection system inoperative;

(5) Major firefighting equipment inoperative or in unreliable condition;

(6) Vessels carrying dangerous cargoes without LOC/IMCO Certificate of Fitness, or with expired documents.

CATEGORY TWO:

(1) Cargo piping alterations (operational control: ensure that incompatible cargoes cannot be mixed);

(2) Minor gas detection discrepancies (operational control: use portable gas detectors);

(3) Air locks malfunctioning (operational control: provide ventilation and closely monitor traffic through space);

(4) High/low level alarms inoperative (operational control: ensure careful monitoring of liquid level);

(5) Information on properties and hazards of cargoes not on board (operational control: brief crew and terminal personnel on cargo hazards).

CATEGORY THREE:

(1) Portable hoses have not been tested but appear in good condition;

(2) Nameplate data on cargo tanks not available;

(3) Temporary repairs authorized by OCMI;

(4) Actual location of safety equipment deviates from the vessel safety plan;

(5) Firefighting equipment in satisfactory operating condition but requires biennial servicing.

32-2-10E. ISSUANCE, REISSUANCE, AND AMENDMENTS TO LETTERS OF COMPLIANCE

Letters of Compliance are issued by the OCMI (using Form CG-2832A) upon satisfactory completion of the examination. If only minor deficiencies exist, the LOC may be issued and suitable notation of the deficiencies made in the Examination Record, at the discretion of the OCMI. When the LOC is issued:

(1) All data called for on the face of Form CG-2832A shall be entered;

(2) The expiration date shall be entered (always two years from the examination date). When an additional partial examination is necessary to verify correction of deficiencies prior to issuance of an LOC, the expiration date remains two years from the date of the last complete examination. (NOTE: LOC expiration is not related to IMCO Certificate expiration);

(3) Under "IMCO Certificate", the words "None" or "See Cargoes and Restrictions List" shall be entered as appropriate;

(4) Under "Last LOC Examination" the date/location of the last complete examination shall be entered. Usually, this will be the same as the date/location of LOC issuance;

(5) The OCMI shall sign and date the LOC and the Cargoes and Restrictions List;

(6) The Cargoes and Restrictions List shall be attached to the Letter of Compliance;

(7) The expired LOC and a photocopy of the newly-issued LOC shall be forwarded to Commandant (G-MHM), along with the report required by section 32-2-10H below;

(8) Any deficiencies noted shall be entered in the MSIS.

If the examination reveals that a vessel is unqualified for an LOC:

(1) The results of the examination shall be entered in the Examination Record (or referenced in an attached discrepancy list);

(2) The required information shall be entered on the LOC, with the exception of issue date, expiration date, and signature of issuing officer;

(3) Form CG-2832A shall be delivered to the vessel's master with instructions that he must contact Commandant (G-MHM) to arrange for a re-examination after all deficiencies have been corrected. The master shall also be instructed to present the form and any attached discrepancy letters to the OCMI/COTP in the next U.S. port of call;

(4) The Cargoes and Restrictions List and the examination set which has been provided by the Commandant shall be expeditiously returned directly to Commandant (G-MHM), along with the report of the examination. When the master intends to proceed directly to another U.S. port to clear the deficiencies noted during the examination, the OCMI/COTP of that port shall be notified and the Cargoes and Restrictions List and the examination set shall be forwarded to the OCMI/COTP. Commandant (G-MHM) shall be notified by message when this action is taken;

(5) Discrepancies shall be entered in the MSIS.

The vessel owner must notify Commandant (G-MHM) whenever name, registry, ownership, or operator changes occur. He is also responsible for forwarding copies of amended or updated IMCO certificates. Commandant (G-MHM) will contact the OCMI/COTP at the vessel's next port of call so that the vessel can be boarded and the appropriate changes made to the LOC. At the discretion of the OCMI/COTP, a new LOC may be issued or "pen and ink" corrections may be made to the current LOC. If a new LOC is issued, the expiration date from the previous LOC shall be used. Notes in the "Remarks" column of the Examination Record shall indicate the action taken.

If a vessel representative requests amendments to Cargoes and Restrictions Lists, he shall be referred to Commandant (G-MHM).

32-2-10F. INVALIDATION OF LETTERS OF COMPLIANCE

If a vessel is found to have serious discrepancies making it unsuitable for the carriage of bulk dangerous cargoes in U.S. ports, the LOC may be invalidated by making the following entry in the "Remarks" column of the Examination Record:

"Letter of Compliance INVALIDATED This Date."

The COTP shall then:

(1) Enter the requirements for correction of the deficiencies in the "Remarks" column, or refer to an attached letter;

(2) Instruct the master that his vessel is no longer authorized to carry compliance cargoes in U.S. ports and that he must arrange for a re-examination through Commandant (G-MHM). The master must also present the invalid LOC and attached discrepancy letter(s) to Coast Guard boarding officers at subsequent U.S. ports of call;

(3) Notify Commandant (G-MHM) and the COTP of the next port of call, by message, of action taken;

(4) Make a "Vessel of Particular Interest" entry in the MSIS, stating "LOC INVALIDATED" and listing discrepancies found.

Other circumstances which result in the LOC's invalidation include expiration of the IMCO Certificate of Fitness and change of registry. Although the LOC may become invalid at any time the preconditions for validity are not met, the LOC always expires two years from the date of the last complete examination.

32-2-10G. EXAMINATION RECORD ENTRIES

Entries shall be made in the "Examination Record" section of Form CG-2832A at the following times:

- Initial examinations and biennial re-examinations;
- Annual tank vessel safety examinations;
- Examinations incidental to repairs or alterations;
- Examinations to check correction of outstanding discrepancies;
- Boarding incidental to the amendment of the LOC by name, ownership, or other entries on the LOC;
- Routine safety boardings involving discrepancies;
- Invalidation or revalidation of LOC.

The results of each examination or boarding shall be entered in the "Remarks" column of the Examination Record. When discrepancies are found, they shall be listed along with corrective actions taken or required to be taken; any requirements as to the type of repairs and time permitted for completion shall be included. For each discrepancy which remains uncorrected, the OCMI/COTP shall specify a period of time in which each deficiency must be corrected (e.g., at next U.S. port of call, within 90 days, at completion of next drydocking, etc.). If a discrepancy list is too extensive to enter on the Examination Record, an entry shall be made referring to a separate, attached letter. This letter shall be signed and dated by the inspector (or OCMI/COTP, depending on local policy). The master shall be instructed that he must keep the referenced letter available for subsequent Coast Guard boardings.

If the "Examination Record" section of Form CG-2832A is filled, a second copy of this form shall be attached to the LOC and its "Examination Record" section utilized for subsequent entries. Some typical entries made in the "Examination Record" section are:

- Vessel examined for issuance of LOC - no deficiencies, LOC issued;

- Letter of Compliance INVALIDATED this date - see COMSO Port Arthur letter dated 16 November 1977;

- Routine safety boarding - incompatible cargoes stowed in adjacent tanks, corrected;

- Vessel examined for reissuance of LOC - certificate of relief valve settings not on board, to be provided at next U.S. port of call - LOC reissued;

- Vessel examined in accordance with 33 CFR 155, 156, and 164; 46 CFR 35; and SOLAS 74 - no deficiencies;

- Letter of Compliance REVALIDATED this date - deficiencies noted in COMIO Houston letter of 21 April 1977 satisfactorily corrected.

32-2-10H. REPORTS OF LOC EXAMINATIONS OR ROUTINE SAFETY BOARDINGS

Reports shall be made to Commandant (G-MHM) at the completion of the following:

(1) An examination for initial issuance of an LOC or a biennial re-examination for reissuance (preliminary message followed by written report);

(2) An annual tank vessel safety examination for compliance with 33 CFR 155, 156, and 164; 46 CFR 35; and SOLAS 74 (message only);

(3) A routine safety boarding with discrepancies found (message only);

(4) An invalidation of an LOC (preliminary message followed by written report);

(5) A boarding to check for correction of deficiencies from a previous examination (message only);

(6) An amendment to an LOC (message only).

The written report of an examination subsequent to issuance or reissuance of a Letter of Compliance should include the following:

(1) A photocopy of the face of the newly issued LOC;

(2) Deficiencies found (indicate none, or copy the list appearing on the Examination Record); and

(3) The expired Letter of Compliance/Examination Record and the Cargoes and Restrictions List.

The Tankship Hull Inspection Book, booklet Form CG-840S, shall be retained by the OCMI/COTP. The examination set and the written report of the examination shall be forwarded to Commandant (G-MHM).

32-2-10I. CATEGORIES OF BULK LIQUID CARGOES

In addition to specific regulations governing the issuance of Letters of Compliance, 46 CFR 153-154a also list those hazardous liquid cargoes considered to involve unusual potential operating risks to life and property. A foreign vessel must have a properly endorsed Letter of Compliance before it may carry the listed cargoes in U.S. ports.

Commandant (G-MHM) maintains a list of cargoes not considered to involve potential unusual operating risks to life and property. This list can be found in 46 CFR 154, Annex B. In the event a shipper wishes to transport a chemical cargo not included in 46 CFR 153-154a, the shipper must contact Commandant (G-MHM) for authorization (see 46 CFR 153.5(b)).

Coast Guard personnel finding a foreign vessel loading, discharging, or carrying cargoes which are not listed in or assigned to the lists referenced above, should notify Commandant (G-MHM) immediately. All inquiries regarding the classification of bulk liquid cargoes should be directed to Commandant (G-MHM).

Chemical cargoes that have been determined to be too hazardous to be carried in U.S. waters are:

- Acrolein
- Chlorine (applies to self-propelled vessels only)
- Ethylenimine
- Hydrofluoric Acid
- Hydrogen
- Hydrogen Chloride
- Hydrogen Fluoride
- Methylcyclopentadienyl Manganese Tricarbonyl
- Nitric Acid (in concentrations greater than 70 percent)
- Nitrogen Tetroxide
- Oxygen
- Phosphorus Trichloride
- (beta) Propiolactone

32-2-10J. COMMUNICATIONS WITH COMMANDANT (G-MHM)

Communications should be directed to Commandant (G-MHM) in the following manner:

(1) For information pertaining to the Letter of Compliance program, including questions on vessel regulations, IMCO codes, scheduling of examinations, vessel deficiencies, vessel LOC status, and examination procedures, the Chemical Engineering Branch (Commandant (G-MHM-1)) can be contacted during working hours (0730-1600, Eastern time, Mon-Thurs) at:

- FTS-8/Commercial 202-426-1217;
- TELEX NR: 892 427;
- TWX NR: 710 822 1959.

(2) For information on hazard evaluations, including specific questions on chemical compatibility and chemical classification, the Hazard Evaluation Branch (Commandant (G-MHM-3)) can be reached during working hours (0730-1600, Eastern time, Mon-Thurs) at:

- FTS-8/Commercial 202-426-6260;
- TELEX: 892 427;
- TWX NR: 710 822 1959.

During nonworking hours and on weekends, a representative of the Chemical Engineering or Hazard Evaluation Branch can be reached by calling FTS-8/Commercial 202-426-1830;

32-2-15. APPLICATIONS FOR INSPECTION BY HOME ADMINISTRATIONS

A written request from the home administration is required prior to inspection of a foreign vessel for issuance of a Passenger Ship Safety Certificate, Form CGHQ-968, or a Cargo Ship Safety Equipment Certificate, Form CG-3347. The request shall be in letter form and signed by the consul or other authorized representative of the government making the request. A written application shall not be required for the examination of foreign vessls before issuance of Form CG-4504, Control Verification for Foreign Vessel. A Control Verification examination shall normally be made upon request only. Requests for inspections leading to issuance of Cargo Ship Safety Construction Certificates are not normally considered as "plan review" and approval is usually difficult if not impossible to obtain. Requests from foreign vessels or their administrations for renewal of Cargo Ship Safety Construction Certificates shall be referred to Commandant (G-MVI).

32-2-20. CERTIFICATION

32-2-20A. FORMS CGHQ-968 AND CG-3347, SOLAS CERTIFICATES

A passenger ship which is inspected for SOLAS certification may be issued a Passenger Ship Safety Certificate. A cargo vessel may be issued a Cargo Ship Safety Equipment Certificate. Such certificates must contain a statement to the effect that they have been issued at the request of the country in which the vessel is registered (see Regulation 13, Chapter I of SOLAS.)

32-2-20B. FORM CG-4504, CONTROL VERIFICATION FOR FOREIGN VESSEL

The issuance of a Control Verification to vessels of foreign countries which are parties to SOLAS is not specifically authorized by the convention. Should the owners of a foreign vessel object to issuance of this form, the OCMI should not insist that the form be accepted. It should be explained to the owners, however, that the form provides orderly administration of Coast Guard examinations and expedites entrance and clearance procedures for a foreign vessel calling at more than one U.S. port. As long as Form CG-4504 remains valid, the vessel will not normally be subject to another Coast Guard examination.

46 CFR 2.01-6 describes Form CG-4504 as issued to foreign passenger vessels embarking or carrying passengers from ports in the U.S. Upon request of the

master, owner, or agent, these vessels of countries party to SOLAS shall be issued Form CG-4504 after successful completion of an examination, in the same number of copies as is Form CG-841, the Certificate of Inspection. The date on the Control Verification shall not exceed any expiration date shown on the vessel's SOLAS Certificate.

32-2-20C. AMENDMENTS AND REVOCATIONS

Amendments to Form CG-4504 shall not be made. When changes in the vessel's condition occur, a new form shall be issued. The replacement form shall contain the statement, "This replaces Form CG-4504 dated _______," and shall have the same expiration date as the form it replaces. An extra copy of the replacement form shall be forwarded to the OCMI who issued the original.

Revocation of a Control Verification may be carried out for sufficient cause. However, before revocation occurs, the vessel's representative should be given every reasonable opportunity to correct the condition which indicates revocation of the form. It is anticipated that this procedure would usually accompany an intervention under Regulation 19, Chapter I of SOLAS. When the form is revoked, it shall be removed from the vessel and the master or nearest consular representative of the home administration shall be advised of the revocation in writing. The local collector of customs shall also be advised of the revocation.

32-2-25. SCOPE OF INSPECTIONS

For the issuance of a 1974 SOLAS Convention Certificate (Form CGHQ-968 or CG-3347), the OCMI shall conduct an inspection using standards similar to those applied to U.S. vessels, except in those areas in which the flag administration has standards different from those of the U.S. These standards shall be clearly understood by the OCMI. U.S. inspection standards exceeding those contained in SOLAS shall not be employed. Booklet Form CG-840F shall be used for the inspection record.

A cargo ship subject to SOLAS shall be required to hold a current Cargo Ship Safety Construction Certificate before issuance of a Cargo Ship Safety Equipment Certificate (Form CG-3347). If the vessel does not hold a construction certificate, it should be listed as a deficiency in accordance with subpart 32-2-45. The cognizant consul may waive this deficiency for a short period of time for cause. The Coast Guard does not normally issue a safety construction certificate to a foreign vessel.

The examination of vessels having valid SOLAS certificates shall be limited generally to the scope described in Regulation 19, Chapter I of the Convention. Under Regulation 19, the inspector shall determine that the condition of the vessel's seaworthiness corresponds substantially with the particulars of the vessel's certificate and, if not, whether the vessel can proceed without endangering the lives of its passengers and crew. A literal interpretation of Regulation 19 may lead to the erroneous conclusion that a cursory check of documents only is required; this is not the case. For all vessels carrying persons in addition to the crew, the inspector shall make all examinations, tests, and inspections necessary to be satisfied that the vessel reasonable complies with the standards established by SOLAS.

Examination of a foreign vessel other than a tank vessel shall normally be limited to an equipment and operations check. It should be directed primarily to the safety and adequacy of lifesaving and firefighting equipment and watertight closures. In this regard, a check should be made to determine that all procedures associated with such equipment are satisfactory. In addition, an examination shall be made to verify that safe facilities are provided for persons in addition to the crew. Unless the inspector has reason to believe that the condition of the hull structure or machinery are deficient or observes that they are deficient during the course of the examination, he shall normally presume that they are in compliance with the applicable requirements of SOLAS. Examinations leading to issuance of Form CG-4504 shall be more complete than re-examinations. If unsafe conditions are found, the examination shall be carried as completely as necessary to ensure that the vessel can be operated safely. After verification of documents, the extent of an examination shall be governed by the circumstances of the particular vessel, including the following factors:

a. The age of the vessel (age shall be considered in determining condition and those requirements applicable under SOLAS);

b. The date the vessel was last inspected or examined by the home government;

c. The extent of the last inspection by the home government (i.e., reinspection, inspection for renewal of a certificate, etc.);

d. The date of the last Coast Guard examination;

e. The record of maintenance and operation;

f. Reports of conditions from ship's officers and crew members;

g. Conditions found on board through spot checks (i.e., a finding of defective items should lead to further checks until the true overall condition of the vessel is ascertained).

Examination of cargo vessels (other than tank vessels) which do not carry passengers in addition to the crew from ports in the U.S., while not intended as a matter of routine, may be conducted to guard against known hazardous conditions, to ensure compliance with U.S. regulations, or to investigate reported unseaworthy conditions. These examinations shall usually be of limited scope. If unseaworthy conditions are found, including unsafe hull conditions, the OCMI shall require corrective action or take control measures as described in subpart 32-2-45.

32-2-30. FIRE AND BOAT DRILLS ON CONVENTION VESSELS

The terms of SOLAS shall not be considered to prohibit the holding of drills on foreign vessels being examined by the Coast Guard. However, unnecessary duplication of drills is discouraged.

As appropriate, emergency drills aboard foreign passenger vessels should be conducted as a prerequisite to the issuance of Form CG-4504, "Control Verification for Foreign Vessel" and at quarterly reexaminations. At each fire drill, the Coast Guard inspector shall insure that the vessel crew has included in its contingency planning necessary procedures to conduct a firefighting operation while moored. Emphasis should be placed on simulated hookup to shoreside water pressure through the international shore connection and a plan to provide necessary interpreters to facilitate English language communication and coordination with shoreside firefighting personnel and resources.

Cargo vessels which carry persons in addition to the crew shall not normally be required to hold emergency drills as part of a Coast Guard examination. Drills shall be required when there is reason to question the condition of equipment or the efficiency of operation. Drills shall also be witnessed by a Coast Guard inspector when requested by the master or agent.

The policy in this subpart shall not prevent the OCMI from requiring any tests and emergency drills which are considered necessary to determine that a foreign vessel does nor does not comply with SOLAS requirements.

32-2-35. VESSELS CARRYING DANGEROUS CARGO.

Foreign vessels are subject to the requirements of the Dangerous Cargo Act (46 U.S.C. 170 et seq) and the Hazardous Materials Transportation Act (49 U.S.C. 1802 et seq) when in U.S. waters. Procedures for vessels carrying bulk dangerous liquids or bulk liquefied gases can be found in subpart 32-2-10. Procedures for vessels carrying dangerous cargoes other than bulk liquids or liquefied gases are contained in Chapter 47 of this manual.

32-2-40. INSPECTION REPORTS

To maintain uniform inspection control of foreign vessels, the inspection booklet Form CG-840F, Control Examination or Verification of Foreign Vessel, shall be used. Items which are usually most important during vessel examinations have been itemized in this booklet. Foreign vessels seeking SOLAS Certificates shall be examined as indicated. Because examinations vary according to the conditions on board each vessel, Form CG-840F should not be considered a step-by-step form to be completed during every examination, but as a memory aid to assist in the complete and accurate recording of facts in whatever areas examination is made.

The inspector shall prepare Form CG-840F as an examination guide, making notations on the blank page opposite the items which give SOLAS 74, the '78 Protocol, or SOLAS 60 requirements, as applicable. The inspector's examination report shall be filed by the OCMI in the same manner as a U.S. vessel inspection report.

32-2-45. CORRECTION OF DEFICIENCIES

Deficiencies found by the inspector that are within the scope of Regulation 19, Chapter I of SOLAS shall be brought to the immediate attention of the master or the owner's representative. Controversial items shall be brought to the timely attention of the OCMI.

Normally, deficiencies will be corrected when brought to the attention of the vessel's representative. In controversial instances, however, when correction cannot be obtained through the vessel's representative(s), the circumstances shall be brought to the attention of the vessel's nearest consular representative, by letter from the OCMI. The consul requesting the examination will determine which deficiencies are not applicable to the vessel under the administration's interpretation of SOLAS requirements. The consul is requested to specify those inapplicable deficiencies and the reasons for their inapplicability in replying to the OCMI prior to issuance of SOLAS certificates. Copies of the deficiencies and the consul's letter of reply shall be forwarded to Commandant (G-MVI) for information purposes. This procedure will relieve the OCMI of having to maintain and interpret individual rules and regulations applicable to each SOLAS administration.

Control which is exercised under the authority of Regulation 19 should vary according to the circumstances and hazards encountered. For relatively minor deficiencies, a letter to the master (with an information copy forwarded to the consul) bringing problems to his attention may suffice. Deficiencies of a more serious nature may give rise to intervention. Commandant (G-MVI) shall be notified of such intervention by message, and the nearest vessel representative by letter. If the vessel cannot sail without danger to passengers or crew, the matter shall be brought to the attention of the local collector of customs.

When intervention occurs and a vessel is detained, the facts of the incident must be reported by the Commandant to the Secretariat of IMCO, to satisfy the requirements of Regulation 19. To facilitate preparation of this report, the following information shall be provided to Commandant (G-MVI) when detention has been lifted:

a. The vessel's description and identification data;

b. A list of the material deficiencies which compelled intervention, with reference to the specific regulations of which the vessel is in violation;

c. The name and address of the consular representative advised of the vessel's condition and the time/date of notification;

d. The data (date issued, expired, issued by, etc.) on the vessel's Safety Construction, Safety Equipment, Load Line, and Radiotelegraphy/Radiotelephony Certificates;

e. A brief synopsis of events leading to intervention and the repairs or corrective actions taken;

f. The date the intervention was lifted and the vessel permitted to sail.

PART 32-3--EXAMINATION OF CANADIAN VESSELS

32-3-1. GENERAL

All vessels of countries which are parties to SOLAS, but to which the convention does not apply, shall be considered in the same light as vessels of countries which are not parties to SOLAS. The instructions in part 32-4 of this manual specifically apply to their inspection or examination. Canadian vessels shall be inspected or examined as indicated below.

32-3-5. PROCEDURES FOR EXAMINING CANADIAN VESSELS

32-3-5A. APPLICATION

In the application of inspection laws, Canadian vessels shall be granted the privileges provided for vessels of countries having inspection laws approximating those of the United States. Cargo vessels carrying persons in addition to the crew shall be treated as vessels of a "nation which allows the like privilege to cargo vessels of the United States." These privileges are granted under agreements dating back to 8 May 1905 (see 46 U.S.C. 882).

If more than 16 passengers (persons in addition to the crew), or more than 6 passengers, in the case of a small passenger vessel inspected under 46 U.S.C. 390, are carried on a vessel that is not subject to the provisions of SOLAS, the vessel shall be treated as a passenger vessel. All other vessels embarking and carrying persons in addition to the crew from a port in the United States shall be treated as cargo vessels.

Canadian-flag tank barges are not inspected by that administration. Therefore, Subchapter D regulations apply to Canadian tank barges operating in waters of the U.S. while carrying combustible or flammable liquids in bulk.

32-3-5B. FREQUENCY

Canadian passenger vessels are required to be examined at least annually with re-examinations conducted approximately every three months when they are available for examination, except that small passenger vessels of not more than 65 feet in length shall be examined at least triennially with annual re-examinations. The examination shall be a prerequisite to the issuance of Form CG-4504, Control Verification For Foreign Vessel. The examination shall be sufficient to satisfy the inspector that the vessel has a valid Canadian COI and that the condition of the vessel, her machinery, and her lifesaving equipment are as stated in the certificate. Reinspection is conducted to determine that the vessel and her equipment are being maintained in a satisfactory condition.

32-3-5C. LIFESAVING AND FIREFIGHTING EQUIPMENT

Arrangements have been made for Coast Guard inspectors to examine the lifesaving and firefighting equipment of Canadian passenger vessels in U.S. ports, when a proper application is made by the owner, master, or authorized agent of the vessel. These examinations should be conducted so as to enable the inspectors to determine the condition and reliability of the equipment. Classification society reports and certificates covering the surveys of the hull, boilers, and auxiliary machinery may be accepted as evidence of condition and suitability. Satisfactory fire and boat drills should normally be held and witnessed by Coast Guard inspectors at each examination and re-examination.

Canadian cargo vessels carrying up to 16 persons in addition to the crew shall be examined for compliance with the general intent of the lifesaving requirements of 46 CFR 94 before they are permitted to embark any passengers at or carry them from a port of the United States. These examinations shall be held at least biennially, and annually if the vessel is available. The procedures for warning notification and reporting described in subpart 32-4-10 of this manual apply to Canadian cargo vessels requiring examination.

32-3-5D. DANGEROUS CARGOES

Canadian vessels which carry combustible or flammable liquids in bulk, and vessels of novel design or construction or whose operation involves potential unusual risks, shall be examined as often as deemed necessary by the OCMI to ensure that the applicable requirements of 46 CFR 30.01-5 are being met. Canadian vessels which carry certain dangerous cargoes are subject to the Dangerous Cargo Act (46 U.S.C. 170 et seq) and are required to comply with the general intent of 46 CFR 146-149 (Subchapter N - Dangerous Cargoes). A vessel having a valid Canadian COI shall normally be considered in compliance with Coast Guard requirements unless there is reason to believe otherwise.

The vessel need not be inspected and certificated under 46 CFR 98 for carriage of the dangerous bulk cargoes listed in these regulations, but should be examined as necessary in the interest of safety.

32-3-5E. LOAD LINES

Load line requirements are discussed in Chapter 76 (Volume V) of this manual.

32-3-5F. REFERENCES

The instructions in part 32-2 of this manual with regard to vessels which have valid SOLAS documents shall be used as a guide for the inspection and certification procedures for vessels having valid Canadian Certificates of Inspection. Particular reference should be made to the following text:

- 32-2-20C (Certificate Amendments and Revocations);
- 32-2-25 (Scope of Inspections);
- 32-2-30 (Drills);
- 32-2-35 (Dangerous Cargoes)
- 32-2-40 (Inspection Reports);
- 32-2-45 (Correction of Deficiencies).

32-3-10. APPLICATIONS FOR EXAMINATION

Passenger and cargo vessels (including tank vessels) which carry passengers shall be required to submit a written request for examination suitable to the

OCMI before they are examined for the issuance of a Control Verification, Form CG-4504.

32-3-15. CERTIFICATION

Form CG-4504 shall be issued to Canadian vessels which hold a valid Canadian COI upon satisfactory completion of examination. The expiration date shall be not later than that indicated on the vessel's COI and normally will coincide with it. A new Form CG-4504 shall be issued as necessary to keep the form current. A Control Verification examination will be made at the request of the master, agent, or owner.

PART 32-4--VESSELS OF COUNTRIES NOT PARTY TO SOLAS

32-4-1. GENERAL

The vessels of countries not parties to SOLAS shall be inspected and reinspected in accordance with U.S. vessel inspection laws and regulations. Exceptions to this policy are vessels of the Republic of Taiwan, which carry nonconvention certificates attesting to their meeting the requirements of SOLAS. These will be regarded as having equal weight to SOLAS certificates. In the inspection of foreign vessels under the U.S. vessel inspection laws and regulations, due consideration should be given to the acceptance of equivalent materials and equipment when the vessel does not comply with the exact requirements of the regulations.

Foreign passenger vessels shall make written application to the the cognizant OCMI prior to inspection. Vessels that satisfactorily complete an inspection for certification under U.S. requirements shall be issued a Certificate of Inspection (Form CG-841 or CG-3753) as prescribed by 46 CFR 2.01-5. A Temporary Certificate of Inspection (Form CG-854) and/or Certificate of Inspection Amendment (Form CG-858) may also be issued to foreign passenger vessels that are inspected and certificated under U.S. requirements in the same manner that they are issued to domestic vessels.

Foreign cargo vessels (including tank vessels) which carry persons in addition to the crew shall be required to submit a written request for examination which is suitable to the OCMI prior to examination. Vessels which meet the requirements of subpart 32-4-10 may be issued Form CG-4504, Control Verification For Foreign Vessel.

32-4-5. NON-CONVENTION PASSENGER VESSELS

Vessels of foreign countries which are not parties to SOLAS, or vessels to which the convention does not apply, which embark any passengers at or carry more than 12 passengers from any port in the United States, and certain foreign small passenger vessels which carry more than six passengers from any port in the United States, are required to be inspected and certificated as indicated in 46 CFR 70.05-3 or 46 CFR 175.05-3, as appropriate. The scope of these inspections is indicated within the regulations and is, generally, the same as for a U.S. vessel required to be inspected for certification.

The inspector's reports shall be made in inspection booklet Forms CG-840A, CG-840B, CG-840H, and CG-840T, as appropriate. These reports shall be filed in the office records of the OCMI.

32-4-10. NON-CONVENTION CARGO VESSELS WHICH CARRY PERSONS IN ADDITION TO THE CREW

Cargo vessels are not normally subject to a complete Coast Guard inspection; however, 46 U.S.C. 882 does permit the examination of lifesaving equipment on such vessels. While a complete vessel inspection is not mandated, it is not intended that the OCMI permit persons in addition to the crew to be embarked aboard a vessel that is obviously unsafe; therefore, a general cursory examination is permitted in order to help the OCMI in determining that the vessel is safe for the persons on board.

A certificate of safety or a similar document, issued either by an official of the government under which the vessel is registered or a recognized classification society, is required. In addition, the following examinations shall be made:

(A) Lifesaving equipment shall be examined to determine if the equipment meets, as a minimum, the standards prescribed in SOLAS 74, as interpreted and applied by the U.S. Examination procedures shall follow those outlined in 46 CFR 90-105 (Subchapter I - Cargo and Miscellaneous Vessels) to the extent deemed necessary by the OCMI.

(B) A general examination shall also be made of the vessel's hull and machinery to determine if clearly hazardous conditions exist. Attention shall be directed to the stowage of lifesaving equipment, the adequacy of escape routes and fire protection equipment, and the condition and operability of watertight closures. Checks shall be made to determine if procedures associated with such equipment are satisfactory.

Vessels which do not meet these requirements shall not be permitted to embark persons in addition to the crew in a U.S. port; however, persons in addition to the crew who arrived with the vessel may continue the voyage.

At the time of the examination of such vessels, inspectors shall remind the master (and, when practicable, the owner and agent of the vessel) of the responsibility under 46 U.S.C. 882 to notify persons in addition to the crew of the presence on board of any dangerous articles, or any other conditions or circumstances that would constitute a risk to safety.

Upon the satisfactory completion of the examination of a foreign cargo vessel which carries persons in addition to crew, Form CG-4504 may be issued. This form shall be dated to indicate that it is effective for the same period of time as the vessel administration's certificate of inspection or for a two-year period, whichever is earlier. It shall be renewed as necessary to keep it current, but only upon a proper, written request and upon satisfactory completion of the examination.

The inspector's report shall be made in booklet Form CG-840F, Control Verification for Examination Of Foreign Vessels. This report shall be filed by the OCMI in the same manner as U.S. vessel inspection reports.

32-4-15. NON-CONVENTION CARGO VESSELS WHICH DO NOT CARRY PERSONS IN ADDITION TO THE CREW

Cargo vessels that do not embark and carry passengers or persons in addition to the crew are not normally subject to any inspection and certification requirements. However, special requirements may apply to vessels carrying flammable or combustible cargoes in bulk or dangerous cargoes. Such vessels are also subject to control under the provisions of 50 U.S.C. 191 (Protection and Security of Vessels, Harbors and Waterfront Facilities), the regulations promulgated under the Ports and Waterways Safety Act (33 U.S.C. 1221 et seq), and the Federal Water Pollution Control Act (33 U.S.C. 1321). For those vessels not otherwise subject to control under SOLAS or the U.S. vessel inspection laws and regulations, the OCMI may find it desirable to work with the COTP to obtain correction of manifestly unseaworthy conditions which would endanger the vessel's crew.

32-4-20. NON-CONVENTION TANK VESSELS

Vessels of foreign countries that are not parties to SOLAS which carry flammable or combustible liquid cargoes in bulk shall be inspected and certificated as required by Subchapter D. Note that 46 CFR 30.01-5(e)(1), with regard to special treatment in the inspection of tank vessels of foreign nations having inspection laws approximating those of the United States, does not exempt from inspection the vessels of any nation that is not party to SOLAS. In the application of this regulation, only Canadian vessels which are not subject to SOLAS have been exempted from the inspection requirements indicated.

The scope of the inspection for certification shall be as described in 46 CFR 30-40 and shall be similar to that required for a U.S. vessel;

Vessels carrying bulk dangerous liquids or bulk liquefied gas cargoes in U.S. waters are subject to Letter of Compliance requirements as described in subpart 32-2-10 of this manual. Vessels of countries which are not parties to SOLAS 74 shall be treated individually; all inquiries concerning these vessels should be directed to Commandant (G-MHM).

32-4-25. NON-CONVENTION VESSELS CARRYING DANGEROUS CARGOES

Foreign vessels carrying dangerous cargoes are subject to the requirements of the Dangerous Cargo Act (46 U.S.C. 170 et seq) and the Hazardous Materials Transportation Act (49 U.S.C. 1802 et seq) when in U.S. waters.

Procedures for vessels carrying bulk dangerous liquids or bulk liquefied gas cargoes are found in subpart 32-2-10 of this manual.

Procedures for vessels carrying dangerous cargoes other than bulk liquids or bulk liquefied gases are contained in Chapter 47 of this manual.

CHAPTER 33—MARINE INSPECTOR'S GUIDE TO MATERIALS

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PART 33–1—MATERIALS—GENERAL

▼33–1–1. INTRODUCTION

This chapter contains information pertaining to basic materials, welding, brazing, and material-testing methods used in shipbuilding, alteration, and repair. This information supplements those provisions contained in chapter I of title 46 of the Code of Federal Regulations which are applicable to Tank Vessels (Subchapter D); Passenger Vessels (H); Cargo and Miscellaneous Vessels (I); Small Passenger Vessels (T); and Oceanographic Vessels (U). Materials used during new construction and alteration or repair of hulls shall conform to the applicable requirements of 46 CFR Subchapter F (Marine Engineering).

▼33–1–5. REGULATIONS

The following is a list of the Coast Guard regulations (by subchapter) pertaining to the authority and materials contained in Title 46 CFR Chapter I (Shipping):

- Tank Vessels (D) – 46 CFR 30.01, 31.10–1, 31.30, 31.30–45, 32.57, 32.63, 32.65, 32.70, 32.75, 32.80, and 35.01–1.

- Marine Engineering (F) – 46 CFR 50, 52.01–1, 52.01–40, 52.01–90, 53.01–1, 53.15, 54.01, 54.01–18, 54.05–10, 54.25, 55.10–25, 56.10–5, 56.50–105, 56.60–1, 56.60–2, 56.60–3, 56.60–5, 56.60–10, 56.60–15, 56.60–20, and 56.60–25.

- Passenger Vessels (H) – 46 CFR 70.20, 70.35, 71.15, 72.01–15, and 72.05.

- Cargo and Miscellaneous Vessels (I) – 46 CFR 90.35, 92.01–10, 92.01–15, and 92.07–10.

- Specifications (Q) – 46 CFR 162.

- Small Passenger Vessels (T) – 46 CFR 177.01, 177.05, and 177.10.

- Oceanographic Vessels (U) – 46 CFR 188.01, 188.20, 188.35, 190.20–1, 199.01–10, and 199.07–10.

PART 33–2—BASIC MATERIALS

▼33–2–1. GENERAL

This part contains information and references pertaining to ferrous and nonferrous metals, shipbuilding woods and associated materials, plastics, ferrocement, and special materials. Ferrous and nonferrous metals currently being used for new hull construction and alteration or repair are outlined in the American Bureau of Shipping (ABS) publications entitled *Rules for Building and Classing Steel Vessels* and *Rules for Building and Classing Aluminum Vessels*. Additional information and reference material is given as it occurs in the respective subparts and in part 33–5 of this chapter.

▼33–2–5. FERROUS METALS

Ferrous metals are iron-based metals, most of which possess magnetic properties and can be alloyed with other metals. (Austenitic stainless steel is not magnetic.) The principal ferrous metals are pig iron, cast iron, and steel. The alloying process consists of the addition of different elements, other than iron and carbon, in a percentage large enough to alter the characteristics to obtain ordinary-, medium-, and high-strength carbon steels. The alloying process increases the steels' tensile strength and durability. Specific information pertaining to materials for hull construction and equipment, hull steel castings, hull steel forgings, machinery, boilers, pressure vessels, and piping, including the manufacturing process (open hearth, basic-oxygen, electric furnace, etc.), chemical composition, and types and grades of steel, are contained in sections 43 and 44 of the ABS publication entitled *Rules for Building and Classing Steel Vessels*.

▼*33–2–5A. PIG IRON AND CAST IRON*

Pig iron is a product of the blast furnace and is made by reducing iron ore into crude iron which is cast into blocks called pigs. The pig iron is usually remelted and cast, producing gray or white castings, or is refined in the making of steel. The white cast iron is malleable and capable of being shaped or formed. Another type of cast iron is the ductile or nodular type which is capable of being drawn. Additional information on cast iron can be found in chapter 62, section 4, of the American Welding Society (AWS) publication entitled *Welding Handbook*.

▼*33–2–5B. STEEL*

Steel is a refined iron that has been alloyed with elements such as aluminum, carbon, chromium, cobalt, copper, manganese, molybdenum, nickel, phosphorous, silicon, tungsten, vanadium, etc., to produce high quality special steels. Additional information on steel alloys and high strength steels can be found in chapters 63 through 66, section 4, of the AWS's *Welding Handbook*, and in Merchant Marine Technical Note (MMTN) 4–68.

▼*33–2–5C. COATED IRON AND STEEL*

Galvanized iron and steel are metals that have been coated with zinc to prevent rust. The galvanizing or coating process is produced by hot dipping, electrolysis, zinc dusting, spraying, etc. Additional information on zinc and its properties can be found in chapter 27, section 4, of the AWS's *Welding Handbook*.

▼*33–2–5D. CAST STEEL*

Cast steel is the result of a process whereby molten steel is introduced into molds to obtain different products and shapes called castings. Castings may be final as to form, except for finishing operations, or may be preliminary shapes for the manufacture of other forms. Additional information on cast steel can be found in chapter 62, section 4, of the AWS's *Welding Handbook*.

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▼33-2-5E. *FORGED STEEL*

Forged steel is steel which has been worked, either hot or cold, into some predetermined shape by hammering or pressing. Hot working involves the deformation of the steel above its recrystalization temperature (approximately 1600°F). Hot-forged steel will have mechanical properties which are uniform in all directions. Cold-forged steel will have mechanical properties which are directionally dependent, i.e., the material will be weaker in the direction perpendicular to the forging force. Additional information can be found in AWS's *Guide for Steel Hull Welding* and in paragraph 43.9 of ABS's *Rules for Building and Classing Steel Vessels*.

▼33-2-5F. *CRUCIBLE STEEL*

Crucible steel is a high grade steel made by fusing low carbon steel with charcoal or cast iron in a graphite crucible and is used in tools and dies.

▼33-2-10. NONFERROUS METALS

Nonferrous metals consist of aluminum and aluminum-base alloys, magnesium and magnesium-base alloys, nickel and nickel-base alloys, and copper and copper-base alloys. Generally, these metals are nonsparking and possess nonmagnetic properties that are desirable when the metals are used in electromagnetic fields or near flammable or explosive materials.

▼33-2-10A. *ALUMINUM AND ALUMINUM-BASE ALLOYS*

Aluminum is a lightweight, corrosion-resistant metal that possesses a high tensile strength capability when alloyed with other metals. Pure aluminum only has a tensile strength of approximately 13,000 pounds per square inch (13 k-psi) as compared to values in excess of 88 k-psi for aluminum alloys. The alloying process consists of adding different elements (copper, manganese, silicon, magnesium and silicone, zinc, etc.) to aluminum in percentages which are large enough to alter its physical characteristics. Additional information pertaining to the characteristics of aluminum and typical applications can be found in chapter 69, section 4, of AWS's *Welding Handbook*.

▼33-2-10B. *MAGNESIUM AND MAGNESIUM-BASE ALLOYS*

Magnesium and magnesium-base alloys are incendiary in nature and are not used in new hull construction, alteration, or repair. However, magnesium is used as one of the alloying elements for aluminum.

▼33-2-10C. *NICKEL AND NICKEL-BASE ALLOYS*

Nickel and nickel-base alloys are produced in cast and wrought forms and are generally applied to apparatus involved with high temperatures. Some different types of trademarked nickel alloys are: Duranickel, Monel, Inconel, Nionel, Incoloy, Niomonic, Hasteloy, etc. Additional information pertaining to specifications, chemical composition, physical properties, mechanical properties and applications can be found in chapter 67, section 4, of AWS's *Welding Handbook*.

▼33-2-10D. *COPPER AND COPPER-BASE ALLOYS*

Copper and copper-base alloys are produced in cast and wrought forms and are tough, ductile, and highly malleable. Some different types of copper-base alloys are: copper-zinc alloys, low- and high-brasses; copper-tin alloys, phosphor bronze; copper-silicon alloys, silicon bronze ("Everdur"); copper-nickel alloys; copper-aluminum alloys, aluminum bronze; copper-beryllium alloys; etc. Additional information pertaining to the composition and properties of copper-base alloys can be found in chapter 68, section 4, of AWS's *Welding Handbook*, and in sections 44.33, 44.35, and 44.37 of ABS's *Rules for Building and Classing Steel Vessels*.

▼33-2-15.SHIPBUILDING WOODS AND ASSOCIATED MATERIALS

This subpart contains information pertaining to different types of shipbuilding woods, mechanical fastenings, glues and gluing, and wood preservatives.

▼*33-2-15A. SHIPBUILDING WOODS*

Information and references pertaining to shipbuilding woods are contained in the Navigation and Vessel Inspection Circular (NVC) 1-63. An additional shipbuilding wood worth mentioning is epoxy resin impregrated wood. This process is known as the Wood Epoxy Saturation Technique (WEST) system and has been used in the construction of yachts.

▼*33-2-15B. MECHANICAL FASTENINGS*

Information pertaining to mechanical fastenings and galvanic action between dissimilar metals is contained in NVC 1-63. For special applications, the information contained in the Ship Structure Committee Report SSC-260 may be useful, but specific guidance should be obtained from Commandant (G-MMT).

▼*33-2-15C. GLUES AND GLUING*

Information and references pertaining to marine glues and gluing techniques are contained in NVC 1-63.

▼*33-2-15D. WOOD PRESERVATIVES*

Information and references pertaining to marine wood preservatives and their application are contained in NVC 1-63.

▼33-2-20. PLASTICS

▼*33-2-20A. GENERAL*

This subpart contains information pertaining to plastics and their uses in the construction of small vessels. Plastics commonly used on small vessels are fiberglass reinforced plastic (FRP) laminates, polystyrene, and polyurethane. FRP laminates are used in the construction of hulls, decks, and bulkheads while polystyrene and polyurethane are used to provide buoyancy. The following is a list of the military specifications and standards pertaining to plastics:

- Federal Test Method Std. No. 406 – Plastics: Methods of Testing
- MIL-Y-1140H – Yarn, Cord, Sleeving, Cloth, and Tape-Glass
- MIL-R-7575C – Resin, Polyester, Low-Pressure Laminating
- MIL-C-9084C – Cloth, Glass, Finished, For Polyester Resin Laminates
- MIL-F-9118A – Finish, For Glass Fabric
- MIL-R-9300A – Resin, Epoxy, Low-Pressure Laminating
- MIL-P-17549C(SHIPS) – Plastic Laminates, Fibrous Glass Reinforced, Marine Structural
- MIL-C-19663C(NAVY) – Cloth, Glass, Woven Roving, For Plastic Laminate
- MIL-R-21607C(SHIPS) – Resins, Polyester, Low Pressure Laminating, Fire Resistant
- MIL-P-21929B(SHIPS) – Plastic Material, Cellular Polyurethane, Rigid, Foam-In-Place, Low Density
- MIL-A-22397 – Adhesive, Phenol and Resorcinol Resin Base (For Marine Service Use)
- ASTM D 1621-59T – Tentative Method of Test for Compressive Strength of Rigid Cellular Plastics
- MIL-M-15617A – Mats, Fibrous Glass, for Reinforcing Plastics

Refer to the *Marine Design Manual* by the engineers of Gibbs and Cox, Inc., for more comprehensive information and additional references to current publications.

Information pertaining to the fire safety aspects of polymeric materials can also be found in a ten-volume report by the National Materials Advisory Board of the National Academy of Sciences. Volumes 1 through 5 and volume 9, of this report, are of special interest to the marine industry since they contain the following information which is the latest and most comprehensive yet compiled on polymerics: materials, state of the art; test methods, specifications, standards, and glossary; smoke and toxicity; fire dynamics and scenarios; executive summary; and ships.

Additional information pertaining to past, present, and anticipated uses of polymeric materials appears in a report entitled "Plastics in Shipbuilding." This report was prepared by the Todd Shipyard Corporation as part of the National Shipbuilding Research Program. This program is a cooperative effort between the U.S. shipbuilding industry and MARAD's Office of Advanced Ship Development.

▼*33-2-20B. FIBERGLASS REINFORCED PLASTIC (FRP)*

FRP laminate is a high strength material that is manufactured using a thermosetting process. Resin and glass fibers are combined to form different shapes or structures whose strengths can be predicted and controlled in any direction. Typical marine applications for FRP are in the construction of hulls, decks, bulkheads, etc., for military, pleasure, and commercial craft. FRP laminates are made by placing successive layers of reinforcement, individually impregnated with resin prior to or during layup, against a properly prepared mold of the desired shape, and then allowing the resin to cure. Decks and bulkheads are made using a sandwich-type construction that consists of bonding thin fiberglass skins to thicker low density core materials such as balsa wood, plywood, polyurethane, polystyrene, honeycomb, and cellular cellulose acetate. Refer to MIL-P-17549C and the above specifications and standards for additional FRP specifications and tests.

FRP laminates, as used in the construction of hull structures and lifeboats, shall meet the fire retardant capabilities of MIL-R-21607 as specified in 46 CFR 177.10-5 (subchapter T) and 46 CFR 160.035-8(b) (subchapter Q). Commandant (G-MMT-3) maintains a list of acceptable products for fire retardant resins and foamed-in-place plastics used in lifeboat buoyancy units. This list is provided to field units in the same manner as equipment approval record cards.

The use of FRP laminate as a sheathing (glassing) material on unsound wooden hull structures is considered to be a temporary repair only and is not normally acceptable. The laminate has little flexibility along its length and breadth and tends to develop tension cracks which destroy watertightness and strength. Refer to NVC 1-63 for additional information on FRP as a sheathing material and to NVC 2-63 for the inspection and repair of plastic lifeboats.

▼*33-2-20C. FOAMED PLASTICS*

A foamed plastic is a unicellular prefoamed (polystyrene) or a foamed-in-place (polyurethane) rigid plastic. It is buoyant, lightweight, and offers resistance to water, fungi, and decay. These plastics are used in life-preserving equipment and in hollow areas in FRP boats and lifeboats. Refer to MIL-P-21929B for specifications and tests pertaining to foamed plastics. Polystyrene is a prefoamed plastic that is available in different sizes and shapes. The material can be cut, shaped, and bonded. Polyurethane is a foamed-in-place plastic used to fill hollow spaces in boats.

▼33-2-25. FERRO-CEMENT

Ferro-cement refers to a steel reinforced concrete process used in the construction of concrete vessels. The process, still in the experimental stage, consists of pouring high quality dense concrete (low water to cement ratio) over stressed and non-stressed steel bars or netting to increase the longitudinal and transverse strengths. Additional information pertaining to ferro-cement and its application in boat construction can be found in MMTN 4–69, *Guide to Ferro-Cement and its use in Boat Construction.* Note: One design concept, including estimated cost factor comparisons between a conventional steel ship and a concrete ship for hauling liquefied natural gas (LNG), appeared in the May 1977 edition of the monthly magazine entitled *Ocean Industry.*

▼33–2–30. SPECIAL MATERIALS

▼*33–2–30A. GENERAL*

This subpart contains information and references pertaining to special and incombustible materials which are used in the manufacture of lifesaving equipment. Special and incombustible lifesaving equipment and materials regulations are contained in 46 CFR 160 and 164. The materials listed in these requlations are as follows:

- Part 160 – Lifesaving Equipment (Kapok, Fiberglass, Balsa Wood, Wood, Cork, Unicellular Plastic, and Polyethylene Foam).

- Part 164 – Materials (Cork, Balsa Wood, Kapok, Deck Coverings, Structural Insulation, Bulkhead Panels, Noncombustible Materials, Interior Furniture, Ceilings, Unicellular Plastic Foam, Unicellular Polyethylene Foam, and Microcellular Nylon).

▼*33–2–30B. REGULATIONS*

The specific regulations which are applicable to these special and incombustible materials are as follows:

- Specifications – Lifesaving Equipment (Q) – 46 CFR 160.002–1 & –3; 160.005–1 & –3; 160.009–1 & –3; 160.027–1 & –4; 160.035–1, –3 & –8; 160.039–1 & –3; 160.047–1 & –3; 160.048–1 & –3; 160.049–1 & –3; 160.050–1 & –3; 160.052–1, –3, –3a, & –4; 160.053–1 & –3; 160.055–1, –3, & –4; and 160.060–1, –3, –3a, & –4.

- Specifications – Materials (Q) – 46 CFR part 164.

In addition to the above Federal Regulations, NVC 10–63 contains information pertaining to the application of approved insulation, bulkhead panels, and deck coverings to achieve the various structural fire protection classifications for steel bulkheads and decks required by 46 CFR 32.57 (tank vessels); 46 CFR 72.05 (passenger vessels); and 46 CFR 92.07 (cargo and miscellaneous vessels). Approved insulation lists for deck coverings, structural insulations, bulkhead panels, incombustible materials, and interior finishes for typical Class A-60, A-30, A-15, and A-0 steel bulkheads and decks may be found in CG-190, *Equipment Lists.*

PART 33-3—WELDING AND BRAZING REQUIREMENTS

▼33-3-1. GENERAL

This part contains information pertaining to welder requirements, weldability of metals, electrodes, filler metals, and the different welding and brazing processes. Rules and regulations for welding and brazing are contained in 46 CFR part 57. Section 30 of the ABS Rules for Hull Welding as well as section IX of the ASME Code have been accepted for pressure vessel welding. These rules shall be used except where noted. Additional information and references are given, as required, in the respective subparts and in part 33-5 of this manual.

The following Coast Guard regulations, contained in two subchapters of title 46 CFR, pertain to the welding of pressure vessels and lifesaving equipment:

- Marine Engineering (F) – 46 CFR 50.25-30, 52.05, 53.13, 54.05-17, 54.20, 54.23, 55.10-20, 55.10-25, 55.15-5, 55.20-5, 56.30-5, 56.30-30, 56.70, 56.75, 56.85, part 57, 59.01-3, 59.10, and 59.20.

- Specifications (Q) – 46 CFR 160.032-3(f), 160.035-3(e), and 160.035-6(e).

In addition to these Federal regulations, useful information can also be found in the following sources:

- NVC 1-66 (Requirements for Hull Structural Steel – Structural Continuity),

- NVC 7-68 (Notes on Inspection and Repair of Steel Hulls), and

- MMTN 4-68 (High Tensile Steels and Structural Applications).

▼33-3-5. WELDER REQUIREMENTS

▼*33-3-5A. QUALIFIED WELDERS AND BRAZERS*

Welders and brazers are certified as qualified on the basis of their performance test qualifications and procedure qualifications. The standards for welder and brazer qualification on hulls, pressure vessels, and piping are contained in the following publications:

- ABS's *Rules for Building and Classing Steel Vessels* (paragraph 30.49),

- ABS's *Rules for Building and Classing Aluminum Vessels* (parapraph 30.17), and

- ASME Code, Section IX (paragraphs QW-351 and QB-351).

Some of the processes covered in these publications are:

- Atomic Hydrogen Welding (AHW)
- Gas Welding (FGW or OAW)
- Shielded Metal-Arc Welding (SMAW)
- Semi-automatic Submerged Arc Welding (SAW)
- Semi-automatic Gas Metal-Arc Welding (GMAW or MIG)
- Manual and Semi-automatic Gas Tungsten-Arc Welding (GTAW or TIG)
- Manual and Semi-automatic Plasma-Arc Welding (PAW)
- Flux Cored Arc Welding (FCAW)
- Electroslag Welding (ESW)
- Gas Metal Arc Welding-Electro Gas (GMAW-EG)
- Thermit Welding (TW)
- Brazing

(See 33-3-20A for definitions of the processes.)

Welders and brazers are qualified or certified as to their proficiency in the use and application of different welding processes as outlined in sections 33-3-5B and 33-3-5C. Fully automatic welding and brazing machines are required to pass performance qualification tests but the operators themselves are specifically exempted by 46 CFR Part 50.

▼33-3-5B. *PERFORMANCE QUALIFICATIONS*

A welder's performance test qualifications as outlined in section IX (article III) of the ASME Code as limited, modified, or replaced by 46 CFR 57.05, shall be the qualifying criteria for certification. These qualifications represent a liberalization of control as requested by OCMI's. Qualification of welders shall be on a ferrous and/or nonferrous basis as outlined in section IX of the ASME Code.

A welder's performance test qualifications, as outlined in 46 CFR 57.05-2, may accompany the welder when he is transferred from one plant to another plant of the same company or from one company to another company. Performance qualification requirements for welding or torch brazing in a limited or restricted space and low temperature welding are outlined in 46 CFR 57.05-3 and 57.05-5, respectively. Welders who weld satisfactory procedure qualification test assemblies shall be certified and exempted from said qualification test as outlined in 46 CFR 57.05-4. Performance qualifications issued by other agencies are acceptable, subject to the requirements of 46 CFR 57.02-2.

It should be noted that a welder must be certified as qualified for each procedure he uses and that he must be requalified if he has not used that procedure within the last three months.

▼33-3-5C. *PROCEDURE QUALIFICATIONS*

ASME rules for procedure qualifications have been adopted as outlined in 46 CFR 57.03. A low temperature application section was added as 46 CFR 57.05-5 because of the increased activity in this area. Automatic machine welding is acceptable provided the technique can be approved and the operator demonstrates his ability to operate the equipment. Automatic welding and brazing procedures shall be requalified when; (1) any of the essential variables listed in paragraphs Q-11, QM-11, or QB-11 of section IX of the ASME Code are revised, or (2) every five years for procedures which have not been changed.

▼33-3-10. WELDABILITY OF METALS

The term *Weldability* as defined by the American Welding Society is "the capacity of a metal to be welded under the fabrication conditions imposed into a specific, suitably designed structure and to perform satisfactorily in the intended service." This term is used interchangeably during welding, brazing, and braze welding processes. Reference information on the weldability of ferrous and nonferrous metals appears in sections 33-3-10A and 33-3-10B. Information pertaining to delayed cracking problems and suggested inspections appears in paragraph 33-3-10A(4).

▼33-3-10A. *FERROUS METALS*

Information pertaining to welding processes and weldability of ferrous metals can be found in paragraphs QW-421 and QW-422.1 through QW-422.11 in section IX of the ASME Code; section 30 of ABS's *Rules for Building and Classing Steel vessels*; and chapters 61 through 66 and 88 in sections 4 and 5 respectively, of AWS's *Welding Handbook*.

▼33-3-10A(1). Steel. Steel hull plate which is to be welded should meet the applicable structural steel requirements for hulls as set forth in section 43 of ABS's *Rules for Building and Classing Steel Vessels*. Half rounds, rounds, and bulb bars are usually produced from Bessemer steel which is likely to be very notch brittle at ordinary operating temperatures. Their use for welded attachment to hatch coamings, strength decks, cap rails, sheer strakes, and bottom shells (including bilges), should be avoided accordingly. Half rounds and rounds known to have been produced from open hearth steel having properties similar to those of ABS classes B and C hull plate may be used. In such cases, particular attention should be taken to ensure that all welds are sound and that the welded butts have full penetration. The ends of half-rounds and bulbs should be kept clear of existing structural discontinuities. Half-round installations which disturb the smooth, unnotched edge of the sheer strake should not be fitted.

▼33-3-10A(2). Special Steel. There are some applications where high strength steels, or steels which can be subjected to low temperatures, are used. Special welding procedures are required with such steels to preserve their properties. There is no general special welding procedure for all cases. Each different steel requires a procedure particularly established to maintain its properties. The procedures used apply to repairs as well as to new construction. Special attention is necessary regarding emergency repairs to ships containing special steels to insure that the type of steel in the repair area is identified so that appropriate materials and procedures are used. See MMTN 4-68: Use of High Strength Steels in Structural Applications.

Emergency repairs such as steel replacement, welding, and flame straightening may be made to ships with special steels, provided precautions are developed for the steel being used. Refer to paragraph 33-3-10A(4) and the following Ship Structure Committee reports for additional information:

- SSC-195 *Recommended Emergency Welding Procedures for Temporary Repairs to Ship Steels* (AD668119), and

- SSC-247 *Flame Straightening Quenched- and Tempered-Steels in Ship Construction* (AD00621).

Those cases involving special steels which are not covered by specific instructions or technical notes should be referred to the Commandant (G-MMT) for approval.

▼33-3-10A(3). Castings. Cast metals requiring welding shall conform to the requirements of section IX of the ASME Code as modified by 46 CFR 56.60-15(a)(2) and 59.20. Refer to section 33-3-20D for information pertaining to the welding repair of castings.

▼33-3-10A(4). Delayed Cracking and Inspection Problems. Delayed cracking is a problem that occurs occasionally in certain steel weldments. It has caused major fabrication difficulties in some ships. The condition for its occurrence are due to:

(a) The presence of hydrogen,

(b) The presence of a hardened microstructure in the heat-affected zone and/or weld metal, and

(c) The presence of significant internal stresses in the weld joint.

Delayed cracking is most likely to occur in high carbon, low alloy steels where the carbon equivalent is greater than 0.50. The carbon equivalent (C.E.) is determined by substituting the percentages for carbon (C), manganese (Mn), chromium (Cr), nickel (Ni), molybdenum (Mo), vanadium (V), and copper (Cu), as determined by the steel lot ladle analysis or the steels specification sheet, into the following formula:

$$\text{C.E.} = \%\text{C} + \frac{\%\text{Mn}}{4} + \frac{\%\text{Cr}}{10} + \frac{\%\text{Ni}}{20} + \frac{\%\text{Mo}}{50} + \frac{\%\text{Cu}}{40} - \frac{\%\text{V}}{10}$$

Specific details pertaining to the prevention of delayed cracking and problems associated with inspection can be found in the following two reports:

- SSC-261 *Preventing Delayed Cracks in Ship Welds – Part I* (AD 031525), and

- SSC-262 *Preventing Delayed Cracks in Ship Welds – Part II* (AD 021526).

(Refer to part 33-5 for information on ordering these reports.)

Although these reports provide useful information which should aid in avoiding delayed cracking, the only inspection assurance is through initially inspecting or reinspect-ing welds in potential problem areas at least seven days after the weld is completed. The necessity of such inspection delays is determined individually by considering the materials, weld procedures, local geometry, and the structural significance of the joint.

Repair welding on steels which are susceptible to delayed cracking must follow the approved welding procedures outlined in NVC 7–68. Careful inspection of steel plates and welds on ships where high carbon, low alloy steels are used is necessary during routine inspection periods throughout the service life of the vessel.

▼33–3–10B. NONFERROUS METALS

Information pertaining to specific welding processes can be obtained from the manufacturer's data sheet. In general, welding nonferrous alloys can best be accomplished with one of the inert-gas, shielded-arc processes (tungsten electrode or consumable electrode). For additional information pertaining to weldability of nonferrous metals, refer to the following:

- Section IX of the ASME Code,
- Sections 30 and 35 of ABS's *Rules for Building and Classing Aluminum Vessels*, and
- Chapters 67 through 74 in section 4 of AWS's *Welding Handbook*.

▼33–3–10B(1). Aluminum and Aluminum Alloys. Aluminum and aluminum alloys which are to be welded during new hull construction and the repair or alteration of inspected vessels, shall meet the applicable welding requirements set forth in section 30 of ABS's *Rules for Building and Classing Aluminum Vessels*. Refer to chapter 69A and 69B, section 4, of AWS's *Welding Handbook* for weldability information pertaining to aluminum and aluminum alloys.

▼33–3–10B(2). Magnesium and Magnesium Alloys. Magnesium and magnesium alloys *are not used* in shipbuilding. Reference information pertaining to its properties and weldability can be found in chapter 70, section 4, of AWS's *Welding Handbook*.

▼33–3–10B(3). Nickel and High-Nickel Alloys. Refer to chapter 67, section 4, of AWS's *Welding Handbook* for weldability information pertaining to nickel and high-nickel alloys and castings.

▼33–3–10B(4). Copper and Copper Alloys. Refer to chapter 68 in section 4 of AWS's *Welding Handbook* for weldability information pertaining to copper and copper alloys such as brasses, phosphor bronze, silicon bronze, copper-nickel alloys, aluminum bronze, copper-beryllium alloys, etc., and castings.

▼33–3–15. ELECTRODES AND FILLER METALS

▼33–3–15A. ELECTRODES

Electrodes should be suitable to the steel being welded. The qualified welding procedure will state which electrodes are acceptable. Except where special steels or special approvals are involved, the welding electrodes should be among those tested and listed by the American Bureau of Shipping, as suitable for the welding involved. Electrodes should be kept dry while in storage. Where low hydrogen electrodes are used, it is especially important that they be dehydrated before use. (See report SSC-261 and refer to part 33–5.) Otherwise, moisture picked up from the atmosphere without any direct wetting may result in faulty welds. Unless the electrodes are contained in hermetically sealed containers, they should be baked for a period of time and at the temperature recommended by the electrode manufacturer prior to use.

NOTE: It has been found that electrode baking ovens are sometimes used by welders to heat food. This practice produces a moist atmosphere in the oven which reduces its effectiveness at removing moisture from the electrodes. Faulty welds have been produced for this reason and this practice should not be allowed.

▼33-3-15B. *FILLER METALS*

Foreign and domestic filler metals, including electrodes, wire-flux, and wire-gas combinations, must be tested and listed by the American Bureau of Shipping in the latest edition of its publication entitled *Approved Welding Electrodes, Wire-Flux and Wire-Gas Combinations*. In those cases where limited application may preclude such listing, acceptance by the Coast Guard will be based on a satisfactory procedure qualification by the fabricator. Preferred electrode listings have been removed from CG-190, *Equipment Lists* and replaced with the following statement: "The listing of acceptable welding electrodes by the U.S. Coast Guard has been terminated. The Coast Guard accepts all electrodes that are acceptable to the American Bureau of Shipping."

The regulations in 46 CFR 57.03-1(e) limit the use of type E6012, E6013, E6014, E6024, E7014, and E7024 electrodes. Their use is permitted only when the welding procedure used with the specific electrode is qualified by the local inspector in accordance with the tests and procedures of 46 CFR Part 57. These electrodes may not be used on lifesaving equipment or on ships' hulls in any fabrication or repair involving butt welds in the shell, strength deck, tank top, strength bulkheads, longitudinal strength members nor on galvanized material unless the welding procedure used with the specific electrode of the manufacturer in question is qualified by the local Coast Guard inspector in accordance with the procedures outlined in paragraph 17 of section 30 of the latest edition of ABS's *Rules for Building and Classing Steel Vessels*. (It should be noted that the use of E7024 rod is contingent in ABS's *Approved Welding Electrodes, Wire-Flux and Wire-Gas Combinations* on periodic welding tests carried out to ensure that adequate weld quality is maintained. As a consequence, acceptable welding with E7024 rod cannot be determined on a once-only basis; frequent production tests during welding are required.)

Specific acceptance of a welding procedure for lifesaving equipment shall be obtained from Commandant (G-MMT-3).

In addition, the fabricator shall weld a test plate of the actual material thickness to be used in production to demonstrate to an inspector that he is using the proper welding procedure to obtain complete penetration. These electrodes may be used in hull construction for horizontal and flat filler weld attachments of stiffening members provided the welding procedure and the manufacturer specified electrode are qualified by the local Coast Guard inspector, in accordance with the procedures outlined in paragraph 17 of section 30 of the ABS Rules. In any event, the inspector may require such workmanship tests as he feels necessary to determine that satisfactory welds are being produced.

▼33-3-20. WELDING AND BRAZING PROCESSES

In general, gas or oxyacetylene welding, shielded metal-arc welding, and semiautomatic gas metal-arc welding processes are used on ferrous type metals; semiautomatic gas metal-arc welding, and manual and semiautomatic gas tungsten arc welding processes are used on nonferrous metals. Brazing procedures can be accomplished on the following ferrous and nonferrous metals: ferrous alloys with chromium; ferrous cast alloys, not weldable; aluminum alloys, non-heat-treatable and heat-treatable; copper alloys with aluminum; and nickel alloys with chromium. Refer to paragraphs QW-400 and QB-100 through QB-400 in section IX of the ASME Code for additional welding and brazing information. Also, additional information pertaining to welding processes including the base metal (ferrous and nonferrous) application is contained in the AWS publications entitled:

- *Guide for Steel Hull Welding*,
- Current *Welding Processes Handbook*, and
- *Welding Handbook* (sections 4 and 5).

These publications describe current welding processes including those for hull welding and pressure-vessel welding. The manual shielded metal-arc process is by far the most widely used welding process in shipbuilding.

▼33-3-20A. *DEFINITIONS*

Definitions of the different welding terms describing current welding processes for new hull construction and repair or alteration are contained in paragraphs QW-490 and QB-490 in section IX of the ASME Code and are repeated here for convenience.

▼33-3-20A(1). Atomic Hydrogen Welding (AHW). An arc welding process wherein coalescence is produced by heating with an electric arc maintained between two metal electrodes in an atmosphere of hydrogen. Shielding is obtained from the hydrogen. Pressure may or may not be used and filler metal may or may not be used.

▼33-3-20A(2). Semiautomatic Arc Welding. Arc welding processes with equipment which controls only the filler metal feed. The welding advance, forward motion, is manually controlled.

▼33-3-20A(3). Gas Welding (FGW or OAW). A group of gas welding processes wherein coalescence is produced by heating with a torch-controlled gas flame or flames between a welding rod and the work. The torch-controlled gas flame (heat) is produced by using a combination of oxygen with other fuel gases. Pressure is not used and filler metal is obtained from the welding rod.

▼33-3-20A(4). Shielded Metal - Arc Welding (SMAW). An arc welding process wherein coalescence is produced by heating with an electric arc between a covered metal electrode and the work. Shielding is obtained from decomposition of the electrode covering. Pressure is not used and filler metal is obtained from the electrodes.

▼33-3-20A(5). Semiautomatic Submerged Arc Welding (SAW). An arc welding process wherein coalescence is produced by heating with an arc or arcs between a bare metal electrode, or electrodes, and the work. The welding is shielded by a blanket of granular fusible material (flux) on the work. Pressure is not used, and filler metal is obtained from the electrode and sometimes from a supplementary welding rod.

▼33-3-20A(6). Semiautomatic Gas Metal-Arc Welding (GMAW). An arc welding process wherein coalescence is produced by heating with an electric arc between a filler metal (consumable) electrode and the work. Shielding is obtained from a gas mixture (which may contain an inert gas) or a mixture of a gas and a flux. This process is also known as Mechanized Inert Gas (MIG), Sigma, Aircomatic, etc.

▼33-3-20A(7). Manual or Semiautomatic Gas Tungsten - Arc Welding (GTAW). An arc welding process wherein coalescence is produced by heating with an arc between a single tungsten (nonconsumable) electrode and the work. Shielding is obtained from a gas or gas mixture. Pressure may or may not be used and filler metal may or may not be used. This process is also known as Tungsten Inert Gas (TIG), Heliarc, or Heliweld.

▼33-3-20A(8). Manual and Semiautomatic Plasma-Arc Welding (PAW). A gas tungsten-arc fusion welding process wherein coalescence is produced by heating with a constricted arc between an electrode and a workpiece (transferred arc), or the electrode and the constricting nozzle (nontransferred arc). Shielding is obtained from hot ionized gas issuing from the orifice, which may be supplemented by an auxiliary source of shielding gas. Shielding gas may be an inert gas, or a mixture of gases, pressure may or may not be used, and filler metal may or may not be used.

▼33-3-20A(9). Flux Cored Arc Welding (FCAW). A gas metal arc welding process which produces coalescence of metals by heating them with an arc between a continuous filler metal (consumable) electrode and the work. Shielding is provided by a flux contained within the tubular electrode. Additional shielding may or may not be obtained from an externally supplied gas or gas mixture.

▼33–3–20A(10). Electroslag Welding (ESW). A welding process wherein coalescence is produced by molten slag which melts the filler metal and the surface of the work to be welded. The weld pool is shielded by this slag which moves along the full cross-section of the joint as welding progresses. The conductive slag is maintained molten by its resistence to electric current passing between the electrode and the work.

▼33–3–20A(11). Gas Metal-Arc Welding Electrogas (GMAW-EG). A variation of the gas metal arc welding process using molding shoes to confine the molten weld metal for vertical position welding.

▼33–3–20A(12). Thermit Welding (TW). A group of welding processes wherein coalescence is produced by heating with superheated liquid metal and slag resulting from a chemical reaction between a metal oxide and aluminum, with or without the application of pressure. Filler metal, when used, is obtained from the liquid metal.

▼33–3–20A(13). Brazing. A process wherein coalescence is produced by heating the workpiece to suitable temperatures above 800°F (426.7°C) and by using a nonferrous filler metal having a melting point below that of the base metals. The filler metal is distributed between the closely fitted surfaces of the point by capillary attraction. Heat is obtained by gas flame, resistance, furnace, induction, heated blocks, etc.

▼33–3–20B. WELDING PROCEDURES

The procedures described in NVC 7–68 for edge preparation, welding sequence, and procedure should be applied in the construction, alteration, or repair of hulls.

▼33–3–20C. WELDING DEFECTS

Many of the most common welding deficiencies are described in NVC 7–68 together with the procedures to avoid them.

▼33–3–20D. WELDING REPAIR OF CASTINGS

The regulations at 46 CFR 59.20 (Subchapter F—Marine Engineering) contains the basic requirement relative to the welding repair of castings. When the defects consist of cracks, stopper holes should be drilled at the ends of the cracks before undertaking further work. The use of oxyacetylene (or carbon arc) gouging may result in an extension of such cracks due to local expansion resulting from the heat. It is, therefore, especially important that the soundness of metal be carefully checked by magnetic particle testing after such gouging.

When furnace annealing is not possible, annealing may be satisfactorily accomplished by the use of induction heating, if induction heating equipment of adequate capacity is available. Induction heating may also be advantageously used for pre-heat.

NOTE: Some ASTM casting specifications, which the Coast Guard has adopted without modifications, include sections on foundry repairs. No additional requirements need to be imposed on these.

PART 33-4—MATERIALS TESTING METHODS AND DEVICES

▼33-4-1. GENERAL

This part describes the instruments and techniques which are applied in the testing of materials used during new construction and the repair or alteration of inspected vessels. The application can also be made to materials and equipment used on board the vessels. Additional information is contained in Ship Structure Committee reports SSC-245 and SSC-253 for nondestructive inspection of butt welds and non-butt welds, respectively.

▼33-4-5. RADIOGRAPHY

▼33-4-5A. RADIOGRAPHY—GENERAL

A radiograph is an X-ray or gamma ray photograph. Radiography is a process that depends on differential absorption of radiation, other than light, transmitted through a heterogeneous medium. Radiography, either with X-rays, or suitable radioactive isotopes such as Cobalt-60, provides the primary means of detecting subsurface flaws and cracks. It should be noted that radiography will not detect delamination. Radiographic inspection and testing is sometimes 100% required and at other times only randomly required. In either case, a visual inspection is also made.

46 CFR 50.15-5 adopts certain sections of the ASME Boiler and Pressure Vessel Code, subject to limitations and modifications contained in 46 CFR Parts 50-64 (Subchapter F-Marine Engineering). Section V of the ASME Code is entitled Nondestructive Examination. Marine safety personnel who are involved with radiographic nondestructive inspection and testing, should familiarize themselves with Subchapter F and Article 22 of Section V of the ASME code (Recommended Practices and Standards for Radiographic Testing).

Radiograph inspection and testing should be conducted in accordance with a procedure(s) approved by the Coast Guard. Procedures are normally approved by the Commandant (G-MMT) or the district commander (mmt). In some cases the OCMI is the approving authority.

▼33-4-5B. PRESSURE VESSELS

Pressure vessels are tested in accordance with Division 1 of Section VIII of the ASME Code (Pressure Vessels) except as limited, modified, or replaced by specific requirements of 46 CFR Subchapter F. Alternatively, Commandant (G-MMT) may authorize the implementation of the standards in Division 2, Section VIII of the Code. Table 54.01-5(b) in Subchapter F lists the *minimum* radiography requirements for welded pressure vessels.

▼33-4-5C. PIPING

The types and extent of the nondestructive examination required for various classes of piping are set forth in table 56.95-10 of Subchapter F. This table lists the *mandatory minimum* radiograph nondestructive tests for welds in the various classes.

▼33-4-10. MAGNETIC PARTICLE TESTING

▼33-4-10A. GENERAL

Nondestructive testing by the magnetic particle method may be used for the inspection of pipe and plate welds, examination of cracks or laminations in plates occurring during rolling or fabrication, welding repairs to cracks in boiler pressure parts, and welding repairs to carbon steel or alloy castings. In general, this method of nondestructive testing is effective in detecting defects on or near the surface of magnetic materials. The magnetic particle method has definite advantages in detecting such defects as surface cracks and similar discontinuities. Because it is simple to use, it does not involve complicated equipment and does not require a high order of skill. However, the marine inspector using this method of testing should bear in mind that there are certain disadvantages to the method which might produce erroneous results. In order to properly and correctly interpret the indications produced by the magnetic particle method, it is necessary to become familiar with the techniques of this method of inspection.

▼33-4-10B. *DEFINITION*

Magnetic particle testing may be defined as a nondestructive method of detecting defects on or near the surface in suitably magnetized material. This test employs finely divided magnetic powder or particles (iron filings), which tend to congregate in regions of magnetic nonuniformity (so-called leakage fields) associated with the defects.

▼33-4-10C. *PRINCIPLES OF OPERATION*

The magnetic particle method depends on simple magnetic and electrical principles. If a crack or discontinuity in a magnetized piece of magnetic material is so located as to be transverse to the direction of the magnetic field in the material, a "leakage field" will be set up by the discontinuity. This so-called "leakage field" is a distortion or crowding of the flux lines around the ends of the magnetic obstruction caused by the flaw in the material. If the obstruction lies below, but near enough to the surface of the material, some of the flux lines will be crowded outside the surface of the material, and a "leakage field" is produced at the surface over the discontinuity. The closer the flaw is to the surface, the stronger the leakage field. In the case of a surface crack, the field is quite strong and highly localized. If a powder of fine particles of a magnetic material is applied over the surface, some of the powder will be attracted to and held by the "leakage field." The magnetically held pattern produced on the surface of the material is caused by the piling up of the particles of magnetic powder. This pattern outlines the discontinuity and indicates the presence of a defect.

▼33-4-10D. *WET AND DRY METHODS*

Several acceptable methods for magnetic particle examination, employing the dry or wet particle medium discussed below, are presented in appendix VI of division 1 of section VIII of the ASME Code. This appendix should be reviewed since the methods described in paragraph UA-72 are acceptable for use when examining items required to be nondestructively tested by this means.

Materials normally used for the dry method are finely powdered iron particles. These particles are coated to provide greater mobility, and are colored for maximum contrast. The dry method should normally be used on reasonably smooth surfaces. It affords greater sensitivity for the location of larger subsurface defects. The powder should be blown on in the form of a low velocity cloud so that the particles will have an opportunity to line up in indicating patterns as they approach the surface of the magnetized part. Excess powder may be removed from the surface by the use of a low velocity air stream, regulated to just remove excess powder without disturbing lightly held powder patterns. For general inspection of welds and castings, the dry method, using direct or rectified alternating current, should be used for detecting subsurface or deep defects.

The magnetic particles used in the wet method are smaller than those used in the dry method. These powdered particles are suspended in a paste which is mixed with light oil and properly agitated before applying. This medium is applied either by flowing or spraying the suspension over the surface of a magnetized part or by immersing the part in the suspension. The wet method is generally used on smaller parts or those having smooth or machined surfaces. It is considered more sensitive for indicating extremely fine defects, due to the smaller particle size. One form of wet method (Magnaglo) employs a specially prepared paste in which the particles are coated with a dye which fluoresces brilliantly under ultra-violet (black) light. Because the indications are fluorescent and more easily seen, this method of inspection is considered excellent for detecting very fine or small flaws.

▼33-4-10E. APPLICATIONS

Magnetic particle inspection may be used to detect the following defects:

(1) Plates and welds:
  a. Surface or near-surface cracks, both in weld metal and base metal.
  b. Laminations or other defects on the prepared edge of the base metal.
  c. Incomplete fusion and undercut.
  d. Incomplete penetration at the root of the weld bead.
  e. Root and crater cracks.
  f. Inclusions such as gas cavities.
  g. Nonmetallic inclusions in rolled plate.

(2) Castings:
  a. Cracks.
  b. Hot tears.
  c. Shrinkage tears.
  d. Sand and slag inclusions.
  e. Gas porosity.
  f. Pipes.

(3) Forgings:
  a. Folds or laps.
  b. Slag inclusions.
  c. Cracks, seams, etc.

Magnetic particle inspection has found wide application in conjunction with repairs to new parts or on parts that have developed cracks in service. This applies to repairs to weldments, as well as welding repairs to correct defects found in castings and forgings. After the defect has been removed by chipping, gouging, or grinding, magnetic particle examination is usually employed to inspect the cavity after the defective material has been removed. It is thus possible to make certain that the discontinuity has been entirely eliminated before proceeding with the repair weld.

▼33-4-10F. LIMITATIONS AND SAFETY PRECAUTIONS

The magnetic particle method is only applicable to magnetic materials in which the deposited weld metal is also magnetic. It cannot be used to inspect nonferrous materials or austenitic steels. It may also be difficult to inspect a weld between metals of widely dissimilar magnetic characteristics, or welds where the magnetic characteristics of the deposited metal are different from the base metal. Joints between metals of dissimilar magnetic characteristics create magnetic discontinuities. This may produce indications of defects even though the joints themselves may be sound.

The magnetic particle method affords maximum sensitivity on defects which are essentially normal to the surface on which the inspection is made. For example, laminations cannot be detected by this method from the top or bottom surface of a plate, but can be detected if the plate is inspected along the edges where the laminations are at right angles to the magnetic flux. This condition can be brought about by using those techniques which will set up a magnetic field in the proper direction.

The sensitivity of magnetic particle inspection is affected by the surface conditions of the piece. The surface should be clean and dry since oil, water, excessive slag, scale, and rust accumulation will interfere with proper inspection. Surface irregularities appearing on welds, such as undercuts, overlaps, ripples, and rough welds, which may produce irrelevant patterns, or make interpretation of the magnetic indications difficult, should be made smooth by grinding, chipping, or sandblasting.

Due to the sensitivity of this method in detecting surface and near-surface discontinuities, certain conditions in a weld or casting may lead to the formation of powder patterns which are not indications of cracks or other defects and are of no significance in evaluating the soundness of the metal. A check crack in the surface of a rough casting may be brought out as sharply as a deeper crack. However, irrelevant patterns should be examined carefully in order to ascertain that they are not masking discontinuities of a more serious nature.

The alternating current technique should be limited to the inspection of discontinuities extending to the surface, such as fatigue or service cracks. Alternating current magnetizes only the surface layer of the part. Some form of direct current should be used for most magnetic particle inspection. Direct current produces a magnetic field which will penetrate throughout the material being tested.

The strongest indications are usually obtained when the area undergoing inspection is approximately in the flat position. This flat position should be used whenever possible. Satisfactory results may be obtained in the vertical and intermediate positions, although care should be exercised when applying the magnetic powder. Overhead inspection by the magnetic particle method is the least satisfactory and should be avoided whenever practicable.

When contact electrodes or prods are used to introduce the magnetizing current into the material being inspected, arcing may occur at the points of contact if the current is on when the prods are placed on the piece. Such arcing may cause hard spots or gouging of the surface. These spots may give trouble in machining, or may be the focal point for cracks. To avoid arcing when the contact electrodes are used, the magnetizing current should be made after contact has been established. The circuit should be broken after the inspection of the area is completed and before the prods are removed.

▼33-4-15. ULTRASONICS

▼33-4-15A. *GENERAL*

Ultrasonics can be defined as "The testing and inspection of materials through the application of ultrasonic vibrations (frequencies above audio level) and observing the resulting reflected vibrations from the material." The ultrasonic waves are usually sound waves of a frequency well above the audible range. These waves are reflected within the material either by its opposite side or by a flaw or discontinuity.

Ultrasonic nondestructive testing may be used as an alternative method to radiography in some cases if the procedures are approved by the Commandant (G-MMT). 46 CFR 56.95-10 specifies the type and extent of nondestructive examinations required for various groups of piping. Notations to Table 56.95-10 (Mandatory Minimum NDT for Welds) identify ultrasonics as an alternate inspection method. Certain welded piping joints examined by radiography or ultrasonics need not be tested by magnetic particle testing.

Marine safety personnel who are involved with ultrasonic nondestructive inspection and testing should familiarize themselves with Subchapter F of Title 46 CFR, and Article 23 (Standards and Recommended Practices for Ultrasonic Testing and Inspection) of Section V of the ASME Code.

▼33-4-15B. *MEASURING THICKNESS*

Ultrasonic instruments for measuring metal wall thickness from one side have been permitted by the Coast Guard for use in determining the thickness of plate and pipe in lieu of drilling. Where the design temperature exceeds 750°F (399°C), a nondestructive method of examination, such as the ultrasonic method, can be used for gauging the thickness of the outer walls of pipe bends. This method in examination is intended to eliminate stress raisers caused by drilling and plugging the pipe wall when measuring by mechanical means.

However, where metal thickness may be calipered without drilling the ultrasonic device should not be used in lieu of the former method of gauging. It should be recognized that there are definite limitations in the use of ultrasonic devices for measuring thickness. Therefore, to apply ultrasonic testing intelligently it is necessary for the marine inspector to have a clear understanding of the basic principle of operation, the techniques of application, and acceptable procedures.

One method of gauging by an ultrasonic device (Reflectogage) is accomplished by sweeping in one direction through a band of frequencies and displaying (on the viewing surface of an oscilloscope's cathode-ray tube) the frequency at which a given thickness of material resonates, that is, when one-half the transmitted wave length equals the thickness of the material. The high frequencies are fed to the material through a quartz crystal in the hand probe. These electrical impulses are changed to sound waves by the crystal. The sound waves travel to the opposite face of the material and are reflected back to the crystal. The resultant energy change is amplified and shows up as a sharp peak (or "pip") on the face of the cathode-ray tube, which is graduated with a scale reading directly in thickness.

An audiogage is a device which does not employ the cathode-ray scope but utilizes an audible signal as a means of detecting the frequency at which a resonance condition is set up in the instrument. A conversion scale, which is essentially a circular slide rule, is mounted on the instrument panel. With the scale set to the proper velocity constant and the pointer set on the frequency obtained, the desired thickness may be read directly on the adjoining scale.

▼33–4–15C. ACCURACY

Prior to the acceptance of thickness measurements it must be demonstrated to marine safety personnel that the operator and instrument are capable of obtaining an accuracy of ±4%. This should be demonstrated by comparing ultrasonic gauging measurements with micrometer measurements of sample plates or pipe similar to the metal walls to be measured.

Ultrasonic devices using the principles of resonance and harmonics may determine thicknesses over a range of 0.0120 inch to 20 inches. When surfaces are parallel and relatively smooth, thicknesses may be read within an accuracy of 2 percent. If surfaces are not parallel, or if there is any pitting or other deterioration of the metal surface, accuracy may be on the order of 5 percent.

▼33–4–15D. PRECAUTIONS

Prior to using an ultrasonic measuring device, marine safety personnel should check the device with a standard test block of known thickness to determine the accuracy of calibration of the instrument. Maximum accuracy is obtained through close contact between the crystal and a clean smooth surface of material. On regularly smooth surfaces, a thin film of light oil or grease will provide a satisfactory coupling. Where surfaces are irregular, a glycerine or soapy water film should be used. On convex or concave surfaces, such as pipe or small cylinders, crystals should have their surfaces ground to fit the contour of material to be tested. Curved crystals will operate satisfactorily in covering a 2-to-1 radius range, i.e., a concave crystal ground to 3-inch radius may be used to determine thickness of pipe down to 1–1/2 inch radius. When surface conditions are good, flat crystals may be used on pipe or convex surfaces which have a radius greater than 4-to-6 inches. It should be noted that the ultrasonic device measures thickness of the area under the crystal detector head only, an effective area of about 1.5 sq.in. It will not detect the presence of small pit holes within this area. In addition, difficulties may be encountered if there is excessive variation in thickness under the area of the crystal probe. Scale, rust, liquids, or carbon formation on the opposite side of the material ordinarily will not affect the accuracy of the instrument but may tend to weaken the signal strength.

▼33-4-20. LIQUID PENETRANT TESTING

▼33-4-20A. *GENERAL*

Liquid penetrant processes are nondestructive testing (NDT) methods for detecting discontinuities that are open to the surface, such as cracks, seams, laps, laminations, and lack of fusion. It can be as effective as magnetic particle testing when detection of surface cracks is desired. It is most useful for nonmagnetic materials. 46 CFR 56.95-10 specifies that liquid penetrant examinations shall be performed in accordance with appendix VIII of section VIII of the ASME Code and these regulations also outline the standards of acceptance. Table 56.95-10 lists the *mandatory minimum* liquid penetrant tests for piping welds.

Each method of testing has its advantages and preferred applications. In recent years the materials and procedures used in liquid penetrant testing have been refined to the point where extremely good results can be obtained.

Without proper surface preparation and application the results of penetrant inspections are likely to be invalid. Magnetic particle testing also suffers from these problems but its techniques are better known and, since expensive equipment is required to properly accomplish such tests, it is not normally used by inexperienced personnel. A kit for making liquid penetrant tests can be purchased for a few dollars and may be used by people who are not entirely familiar with correct procedures.

In individual cases liquid penetrant inspection may be accepted in lieu of magnetic particle testing where the personnel involved, procedures used, and testing materials are evaluated and found acceptable prior to use. It is not desired that permission be granted for extensive use of liquid penetrant testing in lieu of magnetic particle testing. Only in cases where the personnel involved in the testing have the necessary experience and qualifications to insure that valid results are obtained will permission be granted. In general, liquid penetrant testing, done under the supervision of qualified personnel from the Magnaflux Corporation of Chicago or from some other firm with extensive experience in the field of nondestructive testing, would be acceptable. Testing facilities which have current Navy approval for this type of testing would probably be acceptable, also.

▼33-4-20B. *ACCEPTANCE PROCEDURES*

When an OCMI desires to permit the use of liquid penetrant in lieu of magnetic particle testing, it is recommended that he visit the testing facility and accomplish the following:

(1) Obtain a copy of the written procedure for the proposed testing. This procedure should include information as to method, procedure, and evaluation of test results. In general, only post-emulsification types of liquid penetrants will be acceptable.

(2) Inspect the equipment to be used.

(3) Determine the qualifications of personnel supervising and performing the testing. Training, years of experience, and full-time employment in nondestructive testing are items of interest.

(4) Investigate the availability of representative test samples with known defects for use in checking procedures and materials prior to testing.

If the OCMI is then satisfied that the testing facility is competent, he should request authorization to permit liquid penetrant inspection in lieu of magnetic particle testing from Commandant (G-MMT) via the district commander (mmt). A brief statement covering the above items and any other matters of interest should be included.

▼33-4-20C. *REFERENCES*

Normally, it is not expected that marine safety personnel will be experts in evaluating the results of nondestructive tests. The assistance and opinion of the person supervising the tests are desired and, for this reason, the qualifications and experience of this person are considered of primary importance.

It is suggested that any inspector who is assigned to evaluate liquid penetrant testing procedures or to interpret the results of such tests become familiar with the nondestructive testing publications listed in part 33–5 and the following references:

(1) Subchapter F (Marine Engineering) of 46 CFR.

(2) Appendix VIII to Section VIII of the ASME Code (Pressure Vessels).

(3) Article 24 (Liquid Penetrant Standards) of Section V of the ASME Code (Nondestructive Examination). NOTE: The information on standard methods of LIQUID PENETRANT INSPECTION (SE-165) is identical with ASTM E-165–75.

PART 33-5—MATERIALS—REFERENCES

▼33-5-1. GENERAL

The publications listed in this part are considered to be excellent sources of information and contain titles of many additional references.

▼33-5-5. NAVIGATION AND VESSEL INSPECTION CIRCULARS

- NVC 1-63 – Notes on Inspection and Repair of Wooden Hulls
- NVC 10-63 – Typical Class A-60, A-30, A-15, and A-0 Steel Bulkheads and Decks
- NVC 1-66 – Requirements for Hull Structural Steel – Structural Continuity
- NVC 7-67 – Steels for Low Temperature Service
- NVC 3-68 – Tensile Fasteners
- NVC 7-68 – Notes on Inspection and Repair of Steel Hulls

▼33-5-10. MERCHANT MARINE TECHNICAL NOTES

- MMTN 4-57 – Foam Materials for Flotation
- MMTN 4-68 – Use of High Strength Steels in Structural Applications
- MMTN 4-69 – Guide to Ferro-Cement and its use in Boat Construction

▼33-5-15. AMERICAN BUREAU OF SHIPPING (ABS) PUBLICATIONS

- *Rules for Building and Classing Steel Vessels*
- *Rules for Building and Classing Aluminum Vessels*
- *Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways*
- *Rules for Building and Classing Steel Vessels under 61 Meters (200 feet) in Length*
- *Rules for Building and Classing Offshore Mobile Drilling Units*
- *Rules for Building and Classing Single Point Moorings*
- *Rules for Building and Classing Steel Barges for Offshore Service*
- *Rules for Building and Classing Bulk Carriers for Service on The Great Lakes*
- *Rules for the Approval of Electrodes for Manual Arc Welding in Hull Construction*
- *Rules for the Approval of Wire-Flux Combinations for Submerged Arc Welding*
- *Guide for Construction of Shipboard Elevators*
- *Guide for Repair, Welding, Cladding and Straightening of Tail Shafts*
- *Guidance Manual for Making Bronze Propeller Repair*
- *Approved Welding Electrodes, Wire-Flux and Wire-Gas Combinations*
- *Provisional Rules for the Approval of Wire-Gas Combinations for Gas Metal Arc Welding*
- *Provisional Rules for the Approval of Filler Metals for Welding Higher Strength Steels*
- *Rules for the Construction and Classification of Wooden Ships*

- *Rules for the Radiographic Inspection of Welds – Circular No. 145*

- *Magnetic Particle Inspection-Circular No. 40*

- *Rules for Nondestructive Inspection of Hull Welds*

- *Requirements for Radiographic Inspection of Hull Welds*

▼33–5–20. AMERICAN WELDING SOCIETY (AWS) PUBLICATIONS

- *Welding Handbook, sections 1 through 5*

- *Current Welding Processes*

- *Guide for Steel Hull Welding, AWS 3.5–76*

- *Engineering Materials Handbook*

- *Mantell Welding Handbook* (All Sections)

▼33–5–25. SHIP STRUCTURE COMMITTEE (SSC) REPORTS

- SSC-195 – Recommended Emergency Welding Procedures for Temporary Repair of Ship Steels (AD 668119)

- SSC-245 – A Guide for Interpretation of Nondestructive Tests of Ordinary-, Medium-, and High-Strength Low-Alloy Steel Butt-Joint Weldments in Ship Structures (AD A041376)

- SSC-247 – Flame Straightening Quenched-and-Tempered Steels in Ship Construction (AD-A00621)

- SSC-253 – A Guide for Nondestructive Testing of Non-Butt Welds in Commercial Ships – Part One (AD A014547)

- SSC-254 – A Guide for Nondestructive Testing of Non-Butt Welds in Commercial Ships – Part Two (AD A014548)

- SSC-260 – A Survey of Fastening Techniques for Shipbuilding (AD A031501)

- SSC-261 – Preventing Delayed Cracks in Ship Welds – Part One (AD A031515)

- SSC-262 – Preventing Delayed Cracks in Ship Welds – Part Two (AD A031526)

NOTE: Copies of these reports can be obtained by writing the National Technical Information Service, Springfield, VA. 22151, using the indicated AD number.

▼33–5–30. ADDITIONAL PUBLICATIONS

- *Rules and Regulations for the Construction and Classification of Steel Yachts,* Lloyds Register of Shipping.

- *Steel Construction Manual,* American Institute of Steel Construction, Inc.

- *Welding Engineering*, Rossi, (McGraw Hill Co.).

- *The Welding Encyclopedia*, (McGraw Hill Co.).

- *Procedure Handbook of Arc Welding Design and Practice,* The Lincoln Electric Co.

- Various handbooks published by aluminum manufacturers (distributed at no cost).

- ASTM Specifications (all parts), American Society for Testing Materials (ASTM).

- *Fire Safety Aspects of Polymeric Materials, Volumes 1 through 10 (NMAB 318–1 through –10),* National Materials Advisory Board, National Academy of Sciences.

- *Plastic Fiberglass Boats*, Du Plesis and Scott, (DeGraff Publishing Co.).
- *Fiberglass Boat Design and Construction*, De Plesis and Scott, (DeGraff Publishing Co.).
- *Marine Design Manual for Fiberglass Reinforced Plastics*, (McGraw-Hill Co.)
- *Guide to Plastics*, (McGraw-Hill Co.)
- *Rules and Regulations for the Construction and Classification of Wood and Composite Yachts*, Lloyds Register of Shipping
- *Handbook of Wooden Construction*, Chapelle
- Wire Rope and Strand, Federal Specification RR-W410C
- *Nondestructive Testing Handbook*, Society for Nondestructive Testing, (Roland Press, NY).
- *Principles of Penetrants*, Betz
- *Principles of Magnetic Particle Testing*, Betz
- *Radiographs of Welds*, International Institute of Welding (IIW).
- *X-Ray Standards for Production and Repair of Welds, NA VSHIPS 250–692–2*
- *Handbook of Test Methods and Practices, NA V-SHIPS 918828(a)*
- Military Standard Nondestructive Testing Requirements for Metals, MIL-STD-271.
- *Radiographic Standards for Production and Repair of Welds, NA VSHIPS 0900–003–9000.*
- *Ultrasonic Inspection Procedure and Acceptance Standards, NA VSHIPS 0900–066–3010.*

Chapter 34--(Reserved)

Chapter 35--(Reserved)

CHAPTER 36—INSPECTION OF FACILITIES AND STRUCTURES FOR SAFETY AND POLLUTION PREVENTION

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PART 36-1—INSPECTION OF FACILITIES AND STRUCTURES FOR SAFETY AND POLLUTION PREVENTION—GENERAL

36-1-1. AUTHORITIES

The following statutes, background information, and implementing regulations apply to the inspection of facilities and structures for safety and pollution prevention:

36-1-1A. THE MAGNUSON ACT

The Magnuson Act (50 U.S.C. 191) authorizes the President to require the safeguarding of U.S. harbors, ports, waters, and vessels and waterfront facilities therein whenever he finds the security of the United States to be endangered by reason of subversive activity. In Executive Order 10173, as amended by E.O.'s 10277, 10352, and 11249, President Truman found that the security of the U.S. was endangered and prescribed certain port security regulations (33 CFR part 6) to be enforced by the Coast Guard. He further authorized the Commandant to issue supplemental regulations to carry out this program.

36-1-1B. EXECUTIVE ORDER 10173, AS AMENDED

This order provides authority to prevent both intentional and accidental loss or destruction of vessels or waterfront facilities. Over the years, greater emphasis has been placed upon the prevention of accidental losses and, as a result, the term "port safety" has become prevalent when referring to the Coast Guard's responsibilities under E.O. 10173, as amended.

36-1-1C. TITLE 33 CFR 6.12

These regulations (Supervision and Control of Explosives or Other Dangerous Cargo) give the Commandant authority to designate waterfront facilities for the handling, storage, and vessel loading and discharging of explosives, flammable or combustible liquids in bulk, or other dangerous articles. Authority to require permits for such handling, storage, loading, and unloading is also provided.

36-1-1D. TITLE 33 CFR 6.14

These regulations (Security of Waterfront Facilities and Vessels in Port) authorize the Commandant to prescribe conditions and restrictions relating to the safety of waterfront facilities and vessels in port as he finds to be necessary under existing circumstances.

36-1-1E. TITLE 33 CFR PART 126

To implement 33 CFR 6.12 and 6.14, the Commandant prescribed the supplemental regulations contained in 33 CFR Part 126 (Handling of Explosives or Other Dangerous Cargoes Within or Contiguous to Waterfront Facilities). These regulations designate types of waterfront facilities, delineate permit requirements, and specify conditions which must be met and maintained by facilities which are involved in the handling, storage, loading, or discharging of explosives, flammable and combustible liquids in bulk, or other dangerous articles. Although these regulations initially were issued under the Magnuson Act, they were reissued in 1977 under the Ports and Waterways Safety Act (PWSA). Thus, the civil and criminal penalties of the PWSA now apply to facilities regulations.

36-1-1F. THE PORTS AND WATERWAYS SAFETY ACT OF 1972

The Ports and Waterways Safety Act (PWSA) of 1972 (33 U.S.C. 1221 *et seq.*) promotes the safety and environmental quality of ports, harbors, waterfront areas, and navigable waters of the United States. The Secretary of the Department in which the Coast Guard is operating has been given broad authority to take necessary action to prevent damage to, or the destruction or loss of, any vessel, bridge, or other structure on or in the navigable waters of the United States, or any land structure or shore area immediately adjacent to those waters; and to protect the navigable waters and resources therein from environmental harm resulting from vessel or structural damage, destruction, or loss.

36-1-1G. FEDERAL WATER POLLUTION CONTROL ACT, AS AMENDED

Section 311 of the Federal Water Pollution Control Act (FWPCA) (33 U.S.C. 1321) establishes United States policy that there shall be no discharges of oil or hazardous substances in harmful quantities into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Fishery Conservation and Management Act of 1976). The President was directed to determine those quantities of oil and any hazardous substances the discharge of which, at such times, locations, circumstances, and conditions, will be harmful to the public health or welfare of the United States.

The act further authorized the President to delegate the administration of the act to the heads of those Federal departments and agencies which he determined to be appropriate. The President delegated the functions by promulgating Executive Order 11735 dated 3 August 1973.

36-1-1H. EXECUTIVE ORDER 11735

This Executive Order delegated the following facility inspection-related functions of the FWPCA to the Secretary of the Department in which the Coast Guard is operating:

> ". . . the establishment of procedures, methods, and equipment and other requirements for equipment to prevent discharges of oil and hazardous substances from vessels and transportation-related onshore and offshore facilities, and to contain such discharges;"

To carry out this responsibility, regulations regarding large oil transfer facilities and oil transfer operations were promulgated (see 33 CFR parts 154-156).

This E.O. also designated the Administrator of the Environmental Protection Agency (EPA) to determine those quantities of oil and hazardous substances which will be harmful and those which will not be harmful.

36-1-1I. TITLE 33 CFR PARTS 154 AND 156

The regulations in 33 CFR Part 154 apply to each onshore and offshore facility engaged in transfer of oil in bulk to or from any vessel that has a capacity of 250 or more barrels, except when the facility transfers (1) lubricating oil for use on board a vessel, or (2) non-petroleum-based oil to or from a vessel other than a tank vessel (see 33 CFR 154.100 and 156.100). 33 CFR part 156 applies to the transfer of oil to or from any vessel with a capability of 250 or more barrels on the navigable waters or contiguous zone of the United States.

See also chapter 44 of this manual.

36-1-1J. THE OUTER CONTINENTAL SHELF LANDS ACT

The Outer Continental Shelf Lands Act (43 U.S.C. 1333) provides that the Secretary of the Department in which the Coast Guard is operating shall have authority to promulgate and enforce such reasonable regulations with respect to lights and other warning devices, safety equipment, and other matters relating to the promotion of safety of life and property on the islands and structures located on the Outer Continental Shelf or on the waters adjacent thereto.

The Secretary of Transportation has delegated this authority to the Commandant (see 49 CFR 1.46). The Commandant, in turn, promulgated the safety regulations now contained in 33 CFR Parts 140-147 (Subchapter N – Artificial Islands and Fixed Structures on the OCS).

See also chapter 38 of this manual.

§36-1-1K. ADDITIONAL REGULATIONS

There are various references to waterfront facilities throughout titles 46 and 49 of the Code of Federal Regulations. These regulations were promulgated under the authority of the Tank Vessel Act (46 U.S.C. 391a) and the Dangerous Cargo Act (46 U.S.C. 170).

36-1-5. FACILITIES—GENERAL

§36-1-5A. FACILITIES AND EXECUTIVE ORDER 10173, AS AMENDED

Executive Order 10173, as amended, prescribed the regulations contained in 33 CFR part 6. The term "waterfront facility" is defined therein (see 33 CFR 6.01-4). Identifying a waterfront facility based on the definition is sometimes difficult, and the COTP, when making such a judgment, may be guided by the following examples:

(1) Jurisdiction over waterfront facilities extends to and includes any facility located on, adjacent to, or adjoining buildings located on or contiguous to docks, wharves, or similar structures to which a vessel may be secured. Facilities used in conjunction with pier equipment, but not within the area so described, do not come within the meaning of a waterfront facility. For example, storage tanks located beyond the immediate area of a pier facility, that are separate and distinct units connected to the pier facility only by pipeline, would not be considered as being a part of the waterfront facility. On the other hand, if the tanks were within the immediate confines of the operating area, they would be part of the waterfront facility and jurisdiction would attach.

(2) In the definition of a waterfront facility (33 CFR 6.01-4) the word "contiguous" means primarily those buildings which connect with or adjoin piers, wharves, docks, and similar structures, and also include those buildings which connect directly with other buildings that are situated in whole, or in part, upon such structures. Therefore, a building which is located entirely off the structure of a pier or wharf, and which has no direct contact with, and does not adjoin, some building situated in whole, or in part, upon the structure of a pier or wharf, is not a contiguous building and is not part of the waterfront facility.

(3) A vessel moored to a waterfront facility does not become part of the facility so as to come under the regulations in 33 CFR part 126. The structure, the buildings that are contiguous to the structure, and the equipment and materials on the structure or within the buildings are the only components of a waterfront facility. The definition of a waterfront facility does not include such things as vessels, barges, railways, cranes, cotton presses, working areas, storage piles, roadways, entrance areas, operating areas, stock piles, cargo piles, storage areas, parking lots, fueling areas, storage tanks, handling areas, etc., *unless* such things are upon the structure of the pier or wharf or within a building upon, or contiguous to, the structure.

36-1-5B. DESIGNATED WATERFRONT FACILITIES

The term "designated waterfront facility" is defined in 33 CFR 126.05(a). Included are waterfront facilities which handle certain types of listed cargoes and other dangerous articles or cargo covered by the regulations entitled "Explosives or Other Dangerous Articles on Board Vessels" (46 CFR Part 146) and the regulations governing tank vessels (46 CFR parts 30 to 39 inclusive). Effective 31 December 1976, the regulations entitled "Explosives or Other Dangerous Articles on Board Vessels" (46 CFR Part 146), with the exception of the regulations on military explosives, were revoked. They were replaced by 49 CFR Parts 171-177 (Subchapter C – Hazardous Materials Regulations) on 1 January 1977. Therefore, until 33 CFR 126.05(a) is revised, references to the revoked 46 CFR part 146 regulations are to be construed to actually mean their counterparts in 49 CFR parts 171-177.

It should be noted that 33 CFR 126.05(a) uses the phrase "covered by the regulations entitled . . . ." Therefore, when an exemption is provided in the referenced regulations, that exemption applies to the facility as well. For example, combustible liquids in containers of 110 gallons or less are exempted from the regulations in 49 CFR parts 171–177. Therefore, combustible liquids in containers of 110 gallons or less would not have to be handled at a designated waterfront facility.

An additional problem with the definition contained in 33 CFR 126.05(a) is that no reference is given, for example, to cargoes covered by the regulations entitled "Certain Bulk Dangerous Cargoes" (46 CFR Parts 150–154) or "Solids in Bulk" (46 CFR Part 148). Obviously, it is not sound practice, nor the Commandant's intention, to exclude any hazardous material from the requirement of being handled at a special facility. When 33 CFR 126 is revised, reference will be made to all cargoes regulated by titles 46 and 49 of the Code of Federal Regulations. In the interim, spot checks and/or inspections of facilities shall be expanded to include those installations engaged in transactions involving all title 46 and 49 CFR regulated cargoes.

Facilities engaged in transactions involving hazardous cargoes not currently addressed in 33 CFR 126.05 shall be encouraged to comply with the conditions set forth for a designated waterfront facility or a facility of particular hazard. If a hazardous condition is determined to exist at one of these facilities, the captain of the port may exercise his authority over the movement of vessels, with regard to this facility, to compel corrective action to eliminate the hazardous condition; or he may direct handling, loading, discharge, storage, stowage, and movement, including the emergency removal, control, and disposition of the hazardous materials (see 33 CFR 6.04–8 and 33 CFR part 160).

36-1-5C. FACILITIES OF PARTICULAR HAZARD

A "facility of particular hazard" is a designated waterfront facility authorized to handle, in bulk quantities, the cargoes listed in 33 CFR 124.14(b) or any cargoes for which a permit is required by 46 CFR part 146 or 49 CFR parts 171–177. Note that this definition is somewhat different than that now found in 33 CFR 126.05(b). This is necessary to recognize the existence of the counterpart regulations in 49 CFR parts 171–177 and, at the same time, retain the references to 46 CFR part 146 (the regulations concerning military explosives). 33 CFR 126.05(b) will be rewritten to reflect this change.

36-1-5D. FACILITIES AND THE PORTS AND WATERWAYS SAFETY ACT OF 1972

The PWSA of 1972 addresses structures on or in the navigable waters of the U.S., or any land structure or shore areas immediately adjacent to those waters. The term "waterfront facility" has not been formally defined under the PWSA of 1972; however, it is contemplated that the following will apply for port safety-related matters:

> "waterfront facility" means any building, refinery, tank farm, warehouse, dock, pier, wharf, or other structure in, on, or immediately adjacent to, the navigable waters of the U.S., or on a shore area immediately adjacent to those waters. Facilities include Federal, state, municipal, and private facilities.

36-1-10. FACILITY INSPECTIONS

S36-1-10A. INTRODUCTION

A review of subpart 36-1-1 above reveals the Coast Guard's very broad, and sometimes overlapping, authority to promote safety and protect the marine environment. This authority, when specifically reviewed relative to facilities or structures, indicates a broader area of jurisdiction than that with which the Coast Guard has traditionally concerned itself. Obviously, this is caused by limited resources to cover the broader spectrum and the viable practice of concentrating efforts toward high risk areas. Consequently, as with Coast Guard regulatory efforts, the facility/structure inspection program is directed toward those areas which, if involved in an accident, would have the greatest impact on the public and/or environment.

36-1-10B. TYPES OF INSPECTIONS

36-1-10B(1). Monthly Spot Checks of Designated Waterfront Facilities. This is a cursory examination to detect hazardous conditions or noncompliance with applicable regulations. Spot checks may be made by inspection teams which may visit the facility for other purposes (e.g., vessel boardings, monitoring of transfer operations, or in the performance of routine marine safety patrols). Discrepancies, including those corrected on the spot, must be reported to the facility owner or operator and the COTP. Information concerning a hazardous situation in noncompliance with regulations, and any follow-up action, should be recorded and retained in the COTP's files.

36-1-10B(2). Semi-annual Inspections of Designated Waterfront Facilities. This is a thorough, prearranged examination of a facility to determine compliance with the regulations in 33 CFR part 126 and, if applicable, 33 CFR part 154. The facility inspection team shall make a detailed inspection accompanied by a facility representative. The team shall cite each instance of noncompliance. Discrepancies, including any corrected immediately, shall be reported to the COTP on the Waterfront Facility Inspection Report (Form CG-4200) or on a similar locally prepared form. One copy of this report shall be provided to the facility owner or operator.

36-1-10B(3). Inspection of Artificial Islands and Fixed Structures on the OCS. The inspection of artificial islands and fixed structures on the Outer Continental Shelf shall be conducted by or for the OCMI at such time(s) as he deems necessary. Title 33 CFR part 142 provides guidance on the scope of such inspections and the reporting of deficiencies. See also chapter 38 of this manual.

36-1-10C. FACILITY INSPECTION RECORDS

The regulation in 33 CFR 154.740 requires the facility to keep and make available to the COTP a record of each inspection conducted of that facility by the COTP. A similar type of file for each facility shall be maintained at the COTP's office.

36-1-15. ENTRY INTO PRIVATE PROPERTY

36-1-15A. GENERAL

Entry onto private property which is part of an adjoining shoreline of the waters of the U.S. may be necessary to undertake immediate response activities and subsequent investigations and to perform inspections to insure compliance with regulations promulgated under the Magnuson Act (50 U.S.C. 191) and E.O. 10173, as amended, section 311 of the Federal Water Pollution Control Act (33 U.S.C. 1321), or the Ports and Waterways Safety Act (33 U.S.C. 1221 *et seq.*). In general, Coast Guard personnel have the authority to enter private property on or near navigable waters without a warrant when carrying out oil discharge response activities, investigations, and inspections, if the property is subject to regulations promulgated under the laws mentioned above. This opinion has been expressed by the Chief Counsel of the Coast Guard. Subpart 86-3-30 of this manual provides guidance on entering private property in response to pollution incidents.

The Magnuson Act and E.O. 10173, as amended, apply to vessels, harbors, ports, and waterfront facilities in the United States, and all territory and water, continental or insular, subject to the jurisdiction of the United States, exclusive of the Canal Zone.

The Federal Water Pollution Control Act applies to the discharge of oil or hazardous substances into or upon the navigable waters of the United States (the fifty states, the District of Columbia, Puerto Rico, the Canal Zone, Guam, American Samoa, the Virgin Islands, and the Trust Territory of the Pacific

Islands), adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Fishery Conservation and Management Act of 1976).

The Ports and Waterways Safety Act applies to vessels, bridges, or other structures on or in the navigable waters and adjoining shore areas of the United States (the fifty states, the District of Columbia, Puerto Rico, the territories and possessions of the United States, and the Trust Territory of the Pacific Islands).

36-1-15B. INSPECTIONS—ACCESS AUTHORIZED

Inspections shall be conducted, as they previously have been, on a prearranged basis with a representative of the owner or operator accompanying the Coast Guard inspection team. Industry has historically responded to the Coast Guard's need for access to private property by permitting Coast Guard personnel almost unlimited access to their property. It is a rare occasion when a Coast Guardsman is turned away at the gate. When this occurs, however, the COTP/OCMI must evaluate what actions are appropriate.

36-1-15C. INSPECTIONS—ACCESS RESTRAINED.

The guidance provided in 86-3-30, with some modification in the areas of authority and action officer, is applicable for gaining access to private property for the purpose of inspection or responding to emergency situations. Force shall not be used in nonemergency situations such as inspections. If a search warrant is considered necessary, procedures to obtain this document should be taken in accordance with the *Search Warrant Manual* (CG-475).

The Captain of the Port, in his discussion with an owner who refuses entry to his property, may desire to point out that:

(1) The facility's general permit may be revoked unless consent to an inspection is given since, without an inspection, there is no way to determine whether the facility or structure is entitled to a permit; or

(2) Vessels may be prohibited from mooring at the facility to prevent possible damage to the vessel brought about by a hazardous situation which may be present on the facility. A vessel already moored may be compelled to shift berths from such a facility for the same reason.

36-1-15D. LABOR DISPUTES

The Coast Guard's obligation to perform assigned missions is not affected by the existence of a labor dispute. When Coast Guard personnel are required to cross a picket line to perform such a duty, the person directing the picket line should be courteously informed that the marine safety personnel are on official business of the Coast Guard. As a practical matter, Coast Guard personnel should be able to identify themselves as such. When possible, it may be advisable to reschedule an inspection. This is especially true where picketing has been characterized by violence.

Coast Guard officers and enlisted men are protected in the performance of their official duties by 18 U.S.C. 111 which states:

> Whoever forcibly assaults, resists, opposes, impedes, intimidates, or interferes with any person designated in section 1114 of this title while engaged in or on account of the performance of his official duties, shall be fined not more than $5,000 or imprisoned not more than three years, or both.
>
> Whoever, in the commission of such acts uses a deadly or dangerous weapon, shall be fined not more than $10,000 or imprisoned not more than 10 years, or both.

36-1-20. PENALTY AUTHORITY OF 33 CFR PART 126

On 25 October 1977, the authority for the 33 CFR part 126 regulations became that of the Ports and Waterways Safety Act (PWSA). This restatement of authority makes the civil and criminal penalties of the PWSA applicable to waterfront facility violations. Owners or operators of waterfront facilities may be cited on a Report of Violation, Form CG-2636, for violating 33 CFR part 126 prohibitions, but not directly for failure to comply with the conditions listed in 33 CFR 126.15, 126.16, or 126.27. Thus, violations of the following subsections may be cited: 33 CFR 126.13, 126.17, 126.21, 126.28, and 126.29.

Noncompliance with the conditions in 33 CFR 126.15, 126.16, or 126.27 may warrant one or more of the following:

(1) On-the-spot correction;
(2) Report of violation of 33 CFR 126.13;
(3) Action against a facility's general permit (see 33 CFR 126.31); or
(4) Referral to a U.S. Attorney for prosecution in extreme cases.

PART 36-2—INSPECTION OF DESIGNATED WATERFRONT FACILITIES

36-2-1. GENERAL

This type of inspection is briefly described in paragraph 36-1-10B(2) of this manual. Before commencing such an inspection, the team should review the inspection record of the facility with an eye toward previous instances of non-compliance, hot-work permits, any outstanding deficiencies, latest facility survey, waivers which may have been granted under the authority of 33 CFR 126.11, etc. Form CG-4200, Waterfront Facility Inspection Report, provides the inspection team with a listing of the required conditions which must be met in order for the facility to handle hazardous materials. This form is ideal for the inspection of a general cargo facility.

36-2-5. CONDITIONS FOR DESIGNATION (33 CFR 126.15)

36-2-5A. GUARDS

The intent of this subsection of the regulations is to require guards in sufficient numbers and with proper qualifications to insure adequate surveillance, prevent unlawful entry, detect fire hazards, and check the readiness of protective equipment. Guards should be regularly employed. They should be thoroughly instructed in the operation of fire alarm boxes, fireline hose equipment, and portable fire extinguishers. They should be familiar with the location of telephones and of equipment as well as other characteristics of the property relating to fire protection. Guards should also be familiar with fire department notification procedures.

The National Fire Protection Association (NFPA) has developed two standards applicable to guards: Guard Service – NFPA 601 and Guard Operations – NFPA 601A.

36-2-5B. SMOKING

The intent of this subsection of the regulations is self-explanatory. The Coast Guard must be aware of any local ordinances or regulations which may affect the facility's compliance with this condition. Questionable cases should be discussed with local authorities. It is not enough that the facility owner/operator posts signs; the restriction of these designated areas must be enforced by the facility guards in their efforts to detect fire hazards.

49 CFR 176.171 prohibits smoking on and near any vessel loading or unloading explosives at a waterfront facility. The COTP's representative may designate areas at a safe distance from the vessel. At least one "NO SMOKING" sign must be conspicuously posted on the pier at a reasonable distance from the vessel during the handling, loading, or unloading of explosives.

46 CFR 146.29-29 also prohibits smoking on or near any vessel handling, loading, or unloading military explosives at an explosives or ammunition loading pier. Smoking areas may be designated by a facility owner/operator upon approval of the COTP, *provided* such areas are a safe distance from the vessel. Here again, at least one "NO SMOKING" sign must be conspicuously posted on the pier at a reasonable distance from the vessel.

36-2-5C. WELDING OR HOT WORK

The intent of this subsection of the regulations is to prohibit indiscriminate hot work by providing the COTP with authority to regulate such an operation. The requirements outlined in the Welding and Hot Work Permit, Form CG-4201, outline optimum safety requirements. Local or unusual conditions may be such that not all these requirements are necessary or feasible. In these instances, the COTP may use the waiver authority provided by 33 CFR 126.11.

This subsection also prohibits welding on facilities, or on vessels moored thereto, when explosives are present. No reference is made to the different classes of explosives and therefore this condition is overly restrictive. Here again, COTP's may use the latitude provided in 33 CFR 126.11 to maintain an acceptable level of safety in their respective ports without prohibiting the maximum economic utilization of waterfront facilities.

The prime consideration in evaluating all hot work requests should be safety. If the degree of safety is questionable, a permit should not be issued. Liaison with the local fire marshal should prove to be of assistance in evaluating permit requests of a questionable nature.

The National Fire Protection Association has published standards on the subject of hot-work. They are: Welding and Cutting – NFPA 51; Welding Processes – NFPA 51B; and Control of Gas Hazards on Vessels to be Repaired – NFPA 306.

The regulations concerning welding and burning which are applicable to vessels that are moored at the facility are in 46 CFR 146.02–20 and 49 CFR 176.54.

36–2–5D. TRUCKS AND OTHER MOTOR VEHICLES

The conditions outlined in this subsection of the regulations are rather straightforward and require little interpretation. However, the following additional guidance is provided:

(1) Transient trucks and automobiles should be allowed to remain on piers and wharves only long enough to load or unload cargo. The number of vehicles permitted upon the pier or wharf at one time should be limited to a number which permits free traffic flow. The engines of the vehicles should be stopped while being loaded or unloaded.

(2) The replenishing of the fuel supply, the draining of the fuel supply, or the conducting of repairs should not be permitted on the pier or wharf.

36–2–5E. PIER AUTOMOTIVE EQUIPMENT

Equipment must be kept free from *excessive* oil, grease, and lint so as not to constitute a fire hazard. Each vehicle must carry an approved fire extinguisher. The only exception to this is when the equipment is operating in an area where other facility extinguishers are available and the COTP has approved this type of arrangement at the facility. Such an arrangement should be noted and maintained in the COTP's facility record.

Pier automotive equipment shall not be refueled or repaired on a pier or wharf. All fueling and repairs should be conducted at properly protected locations. Likewise, this equipment should be stored in designated locations away from the pier or wharf.

36–2–5F. RUBBISH AND WASTE MATERIALS

Poor housekeeping creates a constant fire hazard. Inspection teams should inspect for:

(1) Piles of dunnage or scrap;

(2) Rubbish or waste materials on piers or wharves;

(3) Sloppy recoopering rooms, carpenter and paint shops, etc.;

(4) Railcars laden with waste materials;

(5) Inadequate and/or unsuitable waste cans. Rubbish should be kept in metal containers with self-shutting covers and removed or emptied at frequent intervals to prevent dangerous accumulations; and

(6) Hazardous accumulations of dust on trusses, girders, or other structural members.

Inspections should not be limited to obvious areas but should include all out-of-the-way places as well. Both the inside and outside of sheds and other buildings should be examined. Hazards and potential hazards that could cause a fire to start, spread, or which would provide obstacles to those fighting the fire should be particularly noted.

36-2-5G. MAINTENANCE STORES AND SUPPLIES

Supplies which are regulated as hazardous materials in title 46 or 49 of the Code of Federal Regulations may be kept on designated waterfront facilities in amounts necessary to meet normal operating requirements. These materials must not be stored on piers or wharves, but rather, must be kept in safe storage locations remote from combustible materials. Fire extinguishing equipment suitable for the supplies present should be readily available.

36-2-5H. ELECTRIC WIRING

New installations of electric wiring and equipment are in accord with accepted safe practices if they conform to the current requirements of the National Electric Code and local ordinances and regulations. Materials, fittings, and other devices must be of a type approved for use by the Underwriters' Laboratories, Inc., the Associated Factory Mutual Laboratories, or the U.S. National Bureau of Standards. Facilities must maintain existing wiring in a safe condition and without defects or modifications that could cause a fire or personal injury. Defective or dangerous wiring, equipment, or devices must be permanently disconnected.

Among the electrical hazards which the inspection team should look for are:

(1) Conditions causing arcing;

(2) Hazards common to electric motors:

(a) Location too near combustible material;
(b) Location in damp place subjected to corrosive vapors;
(c) Motor allowed to become covered with lint or dust;
(d) Burning out because of overloading or low voltage at motor terminals;
(e) Improper overcurrent protection;
(f) Single phasing of multiphase motors;
(g) Starting equipment that produces arcs;
(h) Heat from starting equipment.

(3) Electrical deficiencies:

(a) Bare wires;
(b) Loose or frayed connections;
(c) Overloaded outlets;
(d) Corroded terminals;
(e) Rust and lint-laden motors;
(f) Lack of high voltage signs near transformers and switch boxes;
(g) Defective insulation.

36-2-5I. HEATING EQUIPMENT AND OPEN FIRES

The recommended guide for safe installation of heating equipment is the National Board of Fire Underwriters Building Code (current edition). Equipment must be maintained in good operating condition. Adequate clearances must be provided to prevent undue heating of nearby combustible materials, and spark arrestors are required where sparks constitute a hazard. Portable heating equipment may be used but must conform to the current requirements of the Underwriters' Laboratories, Inc. and be installed in accordance with the National Electric Code.

Open flame fires in barrels, drums, or similar apparatus are prohibited.

36-2-5J. FIRE EXTINGUISHING EQUIPMENT

Fire extinguishing equipment must be available in adequate quantities, types, and locations for the types of hazards present. The National Fire Protection Association's pamphlets 10 and 10A provide guidance on the selection, distribution, and maintenance of extinguishers. Fire extinguishing and safety equipment must be maintained in a good condition at all times.

36-2-5K. MARKING OF FIRE APPLIANCE LOCATIONS

Fire appliances such as hydrants, standpipes, fire extinguishers, hose stations, and fire alarm boxes must be conspicuously marked and readily accessible. The color used in marking depends upon local regulations but, as a general rule, locations are marked in red and the purpose or number is shown in white lettering. The marks must be placed sufficiently high so they will not be hidden by cargo, stanchions, columns, risers, etc. All locations of fire appliances should be numbered and their locations shown on the facility's floor plan.

36-2-5L. LIGHTING

Waterfront facilities must be adequately illuminated during the handling of hazardous materials. Adequate lighting promotes safe working conditions. Lights should be installed over aisle spaces or where they will not be subject to damage when cargo or vehicles are being worked. Light fixtures should be further protected by wire guards.

Open flame lights or lanterns using kerosene or gasoline are prohibited. Temporary lighting, when required, should be obtained from battery-powered hand lamps or protected electric lamps energized from portable electric generators located outside of the building, warehouse, pier, or transit shed.

36-2-5M. ARRANGEMENT OF CARGO, FREIGHT, MERCHANDISE, OR MATERIAL

Cargo on the waterfront facility must be in an orderly arrangement to permit complete access for fire extinguishment. The regulations in 33 CFR 126.15(m)(2) prohibit flammable or combustible cargo, freight, merchandise, or material, not including bulk material, from being tiered higher than 12 feet. This restriction is very broad in scope. Some older facilities are themselves constructed at least partially of wood, and most materials will burn if enough heat is applied. The COTP must carefully weigh all factors if a waiver of this requirement is requested.

The following National Fire Protection Association pamphlets also provide guidance in the area of cargo arrangement and storage:

(1) *Operation of Marine Terminals*, NFPA 307.
(2) *Indoor General Storage*, NFPA 231.
(3) *Outdoor General Storage*, NFPA 231A.
(4) *Ammonium Nitrate*, NFPA 490.

PART 36-3—INSPECTION OF BULK LIQUID FACILITIES

36-3-1. INTRODUCTION

The inspection of a bulk liquid facility may involve compliance with the regulations in 33 CFR part 126 *and* the pollution prevention regulations in 33 CFR parts 154 and 156; or, the inspection may only involve portions of these regulations. For example, the regulations contained in 33 CFR parts 154 and 156 are not applicable to LNG or LPG facilities. At these facilities, compliance is required with only 33 CFR part 126. However, it should be noted that 33 CFR part 156 regulations may be applicable to a vessel while at a LNG or LPG facility.

36-3-5. DISCUSSION CONCERNING THE INTENT OF 33 CFR PART 154 – LARGE OIL TRANSFER FACILITIES

A. 33 CFR 154.100 – APPLICABILITY.

These regulations are intended to insure compliance with good practice; they are not intended to collect civil penalties only. If violations are detected during routine inspections, on-the-spot *correction* is the primary objective. Minor violations should receive on-the-spot corrections with a notation entered in the record of inspection. A report of violation may be more appropriate for a more serious violation.

The use of the word "when" is intentional since these regulations are not applicable to facilities in all cases. For example, a marina which receives its fuel from a barge must comply with these regulations if the barge has a capacity of 250 barrels or more of oil *regardless* of the quantity being delivered. However, the fueling of a small craft with a fuel capacity of less than 250 barrels by the same marina is not covered by these regulations.

All Federal and state facilities, regardless of the character of the vessels they service, fall under the purview of the regulations in 33 CFR parts 154 and 156, including Department of Defense (DOD) and Coast Guard facilities. Facilities which transfer oil in bulk to public vessels must also comply with these regulations.

The Clean Water Act of 1977 greatly expanded the geographical scope 33 U.S.C. 1321; however, until further amended, 33 CFR 154 only applies to offshore facilities within the navigable waters of the U.S. and the "territorial sea" (see 33 U.S.C. 1362(8)).

B. 33 CFR 154.110 – LETTER OF INTENT.

The "operator," for the purposes of the letter of intent, is the party responsible for the facility and may not necessarily be *an individual*. If a corporation owns and operates a facility, the "operator" is that corporation and not its operating employee (see 154.110(a)).

A "mobile facility" is a mobile unit other than a waterborne vessel; i.e., a tank truck or tank car (see 154.110(b)(3)).

The four-hour notification requirement for mobile facilities is to permit planning for the monitoring of an otherwise nonregulated delivery of bulk oil by unidentified means. Notification procedures for mobile facilities shall be developed locally by the COTP. Operations (such as lightering or midstream fueling) which involve vessels are not subject to the notification requirement of 154.110(b)(3).

C. 33 CFR 154.120 – FACILITY INSPECTIONS.

Facility inspections shall proceed inland from the dock area as far as necessary to identify the "oil transfer system," including the piping arrangement used to transfer oil to or from the storage or processing operations. Required testing of facility equipment "in a manner acceptable to the Commandant" does not necessitate testing all transfer equipment. Such tests as are considered necessary should be conducted to demonstrate that the equipment is adequate for its intended purpose. Established test procedures should also be reviewed.

D. 33 CFR 154.300 – OPERATIONS MANUAL: GENERAL.

Each facility is expected to have an operations manual of such sufficiency that a person generally qualified in oil transfer operations can perform the function in an environmentally safe manner. The manual should not be a primer on oil transfer procedures. Small, simple facilities should have simple manuals, while large, multi-product facilities should have more comprehensive manuals. The manuals shall be reviewed by the COTP to determine the adequacy of the procedures and equipment to prevent any discharge of oil. A bilingual operations manual should be required in areas where English literacy is not predominant among the persons in charge. In certain cases, the contents of manuals may be proprietary in nature and shall not normally be released to non-Coast Guard personnel unless authorized, in writing, by the facility owner/operator.

E. 33 CFR 154.330 – OPERATIONS MANUAL: WAIVERS.

Waivers granted by the COTP shall be in the form of a letter to be inserted in the operations manual.

F. 33 CFR 154.500 – HOSE ASSEMBLIES.

As long as it remains serviceable, existing hose need not be replaced (see 33 CFR 156.170).

G. 33 CFR 154.510 – LOADING ARMS.

Loading arms are ordinarily certified by their manufacturers. If there is a question about a loading arm, the facility shall be requested to obtain the manufacturer's certification.

H. 33 CFR 154.530 – SMALL DISCHARGE CONTAINMENT.

All facilities must have containment systems which will collect any discharges on the facility. A solid-decked facility with a fixed drain collection and processing system is preferred. A portable containment system, while not as desirable, is acceptable where, because of the peculiarities of the facility or its location, fixed systems are clearly not feasible. The capacity of the *entire* system, including collection tanks if fitted, must meet the minimum requirements of these regulations. Temporary arrangements may be accepted pending compliance with 154.530.

The over-water gap between the vessel and the facility is not part of the hose handling and loading arm area (see 154.530(b)).

I. 33 CFR 154.540 – DISCHARGE REMOVAL.

As indicated above, the optimum arrangement is for a fixed drain system to remove discharges and normal precipitation from the facility. In general, the system should be either gravity or mechanically operated. The phrase "safely and quickly" is a relative one and must be considered in relation to the products involved. Large surface areas of highly volatile products (e.g., gasoline) should not have an opportunity to form. In the case of portable containment systems, the potential weight when full must be considered and provisions made for emptying them. A system is unacceptable if the most likely solution by the operator is to drain the container into the water.

J. 33 CFR 154.545 – DISCHARGE CONTAINMENT EQUIPMENT.

Each facility must have discharge containment equipment whether by direct ownership, by membership in a cooperative, or by prearrangement with commercial interests. Shared or commercial equipment must be so located as to be capable of being brought on scene in a timely fashion. The determination of location and timeliness should reflect local conditions. In areas subject to tidal or current actions, the time to deploy would probably be less than for still waters (i.e., in current or tidal locations with ecologically sensitive adjoining areas, booms in place during each transfer operation may be appropriate). With regard to quantity, the facility should be prepared to handle a medium or minor discharge (as defined in the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR 1510).

The language of the act is limited to *containment*. The provisions of the National Contingency Plan, however, apply to removal of a discharge. Therefore, a facility should be prepared to contain *and* remove the contained discharge in keeping with these regulations and the National Contingency Plan.

K. 33 CFR 154.550 – EMERGENCY SHUTDOWN.

This section of the regulations specifically addresses the transfer of oil from the facility to the vessel. Since it is intended that the person in charge of the vessel be able to immediately stop the loading operation in the event of hose failure or overfill, when an "emergency means" is installed it should *normally* be located on the vessel. Among other factors to be considered by the COTP in authorizing one person in charge to act both for the vessel and the facility (see 156.110) is accessibility of the "emergency means."

The flow closure device actuated by the "emergency means" must be physically located in the piping on the facility side of the hose. If the device may cause hydraulic shock to the system, the system must be capable of withstanding such a shock loading.

In the event the person in charge of the vessel does not remain in the proximity of "his usual operating station" where the "emergency means" is located (see 155.780(c)), emergency shutdown capability must be provided at his alternate sites.

The concept of "continuous dedicated communications" as an alternative to the emergency shutdown means relates to the sophisticated facility operated from a central, continuously manned, control center from which the person in charge of the facility has definite communications with the person in charge of the vessel and has remote control of the valves in the transfer system.

An audible alarm system will not satisfy the requirement of "continuous dedicated communications." The dedicated system may be the same as the one required in 154.560 if positive, continuous communications are provided. The use of suitable *portable* communications equipment by the person in charge of transfer operations *on the vessel*, which permits him to move about in supervising the operations, is acceptable.

L. 33 CFR 154.560 – COMMUNICATIONS.

Adequate communications between the vessel and facility is essential to coordinate control of the transfer operation. Two-way voice communication means that each person is able to hear the other. If the two persons in charge are not close enough to hear one another, it is anticipated that the facility will provide a means of communication. For single person in charge operations or for small facilities with a low ambient noise level, an electronic or sound-powered system may not be necessary. Consideration must be given, however, to the probable location of personnel during inclement weather to insure that two-way voice communications continue to be possible. Intrinsically safe equipment is required only in hazardous atmospheres as listed in 46 CFR table 111.80–5(a)(7). The list does not include combustible liquids. Thus, suitable radio devices used to comply with this section of the regulations must meet UL Class I, Group D requirements or their equivalent (intrinsically safe) only during handling of flammable liquids (Grades A, B, and C).

M. 33 CFR 154.570 – LIGHTING.

This section of the regulations provides for adequate illumination in which to conduct a pollution-free operation. Adequacy of existing lighting is specified in the regulations and has been determined by the practical ability to see what needs to be done. Verification by instrument need only be required in highly questionable instances. Illumination should be sited or shielded so as to minimize interference with navigation on the adjacent waterways. At small, remote facilities, where portable lights or illumination are provided by a tug, the shielding of lighting should be specified in the operations manual and in the oil transfer procedures for the vessel.

N. 33 CFR 154.740 – RECORDS.

The proper reference in subsection (c) of this section of the regulations is 33 CFR 156.170, *not* 33 CFR 156.70. This is a typographical error.

36–3–10. DISCUSSION CONCERNING THE INTENT OF 33 CFR PART 156 – OIL TRANSFER OPERATIONS

A. 33 CFR 156.100 – APPLICABILITY.

As presently written, the regulations in 33 CFR part 156 do not apply to facilities in the contiguous zone of the United States. Inside the navigable waters of the United States and the territorial sea (the three-mile limit), these regulations apply to both the vessel and the facility. Future changes may be made to these regulations as a result of the Clean Water Act of 1977.

B. 33 CFR 156.110 – PERSON IN CHARGE: LIMITATIONS.

This section of the regulations does not prohibit single-man, barge loading/unloading operations but gives the COTP clear authority to permit or prohibit such operations. The questions are: "At the particular facility in question and under specified or controlled conditions can one man effectively perform the operation?" and "How complex is the operation and what degree of mechanization is provided to assist the operator?" For example; two adjacent barges moored manifold-to-manifold may be acceptable, while the same barges moored end-for-end, which places the manifolds hundreds of feet apart, may be unacceptable for single-man, loading/unloading operations.

C. 33 CFR 156.120 – REQUIREMENTS FOR OIL TRANSFER.

This section of the regulations supersedes the provisions of 46 CFR 35.35–20(d) which allows the loading of Grades D and E cargoes through an open hatch. (46 CFR subchapter D will be amended accordingly). It also recognizes the potential for minor drips such as those occurring at the packing glands of pumps. However, haphazard conditions, such as loose or leaking fittings which violate 33 CFR 156.130, are unacceptable.

This section does not require that the persons in charge speak English, but only that they be able to speak to each other or that an interpreter be present. This is assuming that each, in turn, can communicate to his subordinates and that at least one can read and understand the declaration of inspection (DOI). In making crew changes or in changing the watch during cargo transfer operations, the oncoming member of the crew should insure that all the provisions of the DOI are being met. When he signs the form he becomes the person in charge.

Unless there is a gross lighting deficiency between sunrise and sunset, the determination of lighting sufficiency by the person in charge involves only an inspection to confirm that the provided lights are in place and functioning properly.

D. 33 CFR 156.150 – DECLARATION OF INSPECTION

Plate 36–3–10D.1 contains a sample declaration of inspection which has been developed by the Commandant in cooperation with members of the Towing Industry Advisory Committee to the Marine Safety Council. Declaration of inspection requirements of 46 CFR 35.35–30 will be revised to insure compatibility between them and the declaration of inspection requirements of this section of the regulations. In the interim, it is intended that forms developed by the industry which contain the minimum information on plate 36-3-10D.1 are to be accepted as fulfilling the requirements of 33 CFR 156.150 *and* 46 CFR 35.35-30. For instance, the Ship/Shore Safety Checklist from the International Oil Tanker and Terminal Safety Guide, sufficiently expanded to include the requirements of these regulations, would be acceptable.

E. 33 CFR 156.170 – EQUIPMENT TESTS AND INSPECTIONS

Hoses, piping, and loading arms covered by this section of the regulations are not subject to the testing requirements of 33 CFR 126.15(o). Also, testing is not limited to hydrostatics. (See section 36-3-20F of this manual.)

36-3-15. TITLE 46 CFR AMENDMENTS

A. 46 CFR 31.10-20 – DRYDOCKING OR HAULING OUT.

This section of the regulations is intended to eliminate leaks from barges on the inland waterways due to routine operational damage. 46 CFR 31.10-20(a)(3) provides an incentive for use of barge designs which incorporate cargo segregation from the vessel's outer skin and thereby provide a markedly reduced risk of pollution. Acceptance of a barge internal examination as an alternative to drydocking should be predicated upon such skin/cargo segregation and the accessibility of the space between the skin and cargo tanks for thorough inspection.

The provision of a delayed effective date for the pollution prevention regulations following publication allowed both the Coast Guard and the industry to "phase in" operational and administrative requirements. Accordingly, an appropriately configured barge, internally examined during the 36 months prior to implementation (July 1974), which is found by the OCMI to be in all respects adequate for its purpose, should be accepted as meeting the requirements of this section. The Certificate of Inspection should be amended to reflect the date of the internal inspection and the barge would be on the 3-year drydock inspection cycle as of that date. Alternate internal examinations and the dates accomplished shall be entered in the space provided for the "date drydocked" on the Certificate of Inspection.

An amendment to 46 CFR 31.10-20 required that all tank barges operating on fresh water be on a 3-year drydocking/internal examination cycle by 1 July 1974. Subsequently, it became apparent that, due to flooding throughout the central part of the nation which interfered with the operation and capabilities of drydocking and gas-freeing facilities, there was no possibility of attaining the 3-year cycle by 1 July 1974. In order to be more realistic, the effective date for full implementation of the regulations was delayed until 1 July 1975. Basically, the new regulation requires that all tank barges operating in fresh water service that were constructed or last drydocked before 1 July 1970 were to be on the 3-year drydocking/internal examination cycle by 1 July 1974; those barges constructed or last drydocked after 1 July 1970 were to be on the 3-year cycle by 1 July 1975.

B. 46 CFR 35.05-15 – WATCHMEN.

Title 46 CFR 35.05-15 requires that at least one member of the crew of a manned tank vessel to be on board at all times, except when the vessel is gas-free or moored at a dock or terminal at which watchman service is provided. When an unmanned barge is moored to a dock or terminal and is not gas-free, a watchman must be provided *or* the cargo tank hatches must be clearly marked "DANGER – KEEP OUT" and must be securely dogged so that no person can open the hatches by use of bare hands alone.

C. 46 CFR 35.30-5(d) – SMOKING.

Smoking is prohibited on the weather deck of tank vessels when they are alongside a dock.

PLATE 36-3-10D.1
SAMPLE DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER

VESSELS ____________

____

TRANSFER FACILITY ____________

LOCATION ____________

	Deliverer	Receiver
1. Communication System/Language Fluency (33 CFR 156.120(m), (p)).		
2. Warning Signs and Red Warning Signals (46 CFR 35.35-30).		
3. Vessel Moorings (33 CFR 156.120(a)).		
4. Transfer System Alignment (33 CFR 156.120(d)).		
5. Transfer System; unused components (33 CFR 156.120(e)).		
6. Transfer System; fixed piping (33 CFR 156.120(f)).		
7. Overboard Discharges/Sea Suction Valves (33 CFR 156.120(g)).		
8. Hoses or Loading Arms Condition (33 CFR 156.120(h), 156.170).		
9. Hoses; length and support (33 CFR 156.120(b), (c)).		
10. Connections (33 CFR 156.130).		
11. Discharge Containment System (33 CFR 156.120(j)(1)).		
12. Scuppers or Drains (33 CFR 156.120(k)).		
13. Emergency Shutdown (33 CFR 156.120(n)).		
14. Repair Work Authorization (46 CFR 35.35-30).		
15. Boiler and Galley Fires Safety (46 CFR 35.35-30).		
16. Fires or Open Flames (46 CFR 35.35-30).		
17. Lighting (sunset to sunrise) (33 CFR 156.120(t)).		
18. Safe Smoking Spaces (46 CFR 35.35-30).		
19. Spill and Emergency Shutdown Procedures (33 CFR 156.120(q)).		
20. Sufficient Personnel (33 CFR 156.120(o), (s)).		
21. Transfer Conference (33 CFR 156.120(q)).		
22. Agreement to Begin Transfer (33 CFR 156.120(r)).		

I do certify that I have personally inspected this facility or vessel with reference to the requirements for the Declaration of Inspection set forth in 46 CFR 35.35-30 and that opposite each of them I have indicated that the regulations have been complied with.

Person in Charge Receiving Unit	TITLE	TIME & DATE
Person in Charge Delivering Unit		

TIME COMPLETED ____________

36-3-20. DISCUSSION CONCERNING THE INTENT OF 33 CFR 126.15(o) – CONTROL OF LIQUID CARGO TRANSFER SYSTEMS

36-3-20A. GENERAL

It must be kept in mind that 33 CFR 126.15(o) contains *conditions* which must be met by facilities in order for them to be designated waterfront facilities.

36-3-20B. PERSON IN CHARGE, CONTROL, AND SUPERVISION

The cargo transfer system in use must be under the continuous control and surveillance of the waterfront facility owner or operator or his assigned representative. This person is considered the "person in charge of the shoreside transfer operation." The implication of this condition is that there shall be a person in charge of the shoreside transfer operation *and* a person in charge of vessel transfer operation. Single-man loading and unloading operations may be permitted by the COTP. The COTP should review proposed operations with an eye toward acceptability from a safety viewpoint, using the philosophy contained in 36-3-10B above.

The person in charge of the shoreside transfer operation must be trained in, and capable of performing *completely*, the necessary operations which relate to the transfer of the specific cargo. The COTP must be provided with satisfactory evidence to this effect. The regulations in 33 CFR 154.710 and 154.730 require the designation in writing of persons in charge, and also require those persons to carry evidence of their designation when engaged in transfer operations, unless such evidence is immediately available at the facility.

The person in charge of the shoreside operation must know:

(1) The hazards of the cargo being transferred;

(2) The regulations which apply to the operation and the cargo being transferred;

(3) The facility operating procedures, local discharge reporting procedures, and emergency procedures; and

(4) The operation of the facility's cargo piping system.

36-3-20C. WARNING SIGNS AND CARGO INFORMATION CARDS

Warning signs are required on the facility at the point of transfer. These signs must face perpendicular to the shoreline *and* in each direction parallel to the shoreline. These signs must also be unobstructed at all times during connect, transfer, and disconnect. The intent of this requirement is that the warning signs face in a direction that will be visible to a vessel approaching the facility directly or approaching on a course parallel to the shoreline from either direction. These signs must conform to the requirements in 46 CFR 151.45-2(e)(1), insofar as description and required information are concerned. Additional information on warning signs as they apply to vessels carrying bulk cargoes may be found in 46 CFR 35.30-1, 39.15-1, 151.45-2, and 153.955.

Cargo information cards for the cargoes being transferred are required to be in the possession of the person in charge of the shoreside operation. The card must include information on:

(1) Cargo identification and characteristics;
(2) Emergency procedures; and
(3) Firefighting procedures.

Cargo identification and characteristics should include the name of the cargo, its appearance and odor, a statement of the hazards involved and instructions on the safe handling of the cargo, and, as applicable, the need for special cargo environments.

Emergency procedures should include precautions to be observed in the event of spills, leaks, or equipment or machinery breakdown, uncontrolled release of the cargo into the waterway or atmosphere, and precautions to be observed in the event of exposure of personnel to toxic cargoes. Firefighting procedures should include precautions to be observed in the event of a fire occurring on or adjacent to the facility and identification of firefighting appliances suitable for use in case of a cargo fire.

Additional information on cargo information cards as they apply to vessels carrying bulk cargoes may be found in 46 CFR 151.45–2 and 153.907.

36–3–20D. ACTIONS PRIOR TO THE TRANSFER OF CARGO

The person in charge shall personally insure that no welding or burning or other types of repair work are being conducted on the transfer system or receiving tanks during the transfer operations. Any welding or burning conducted on a facility which handles, stores, stows, loads, discharges, or transports dangerous cargoes must be pursuant to COTP approval. The person in charge shall personally insure that appropriate warning signs are properly displayed on the facility at the point of transfer. The person in charge shall also insure that where a fixed discharge containment system is not used, adequate portable means are provided to meet the containment requirements. 33 CFR 154.530 provides criteria on sufficiency of the containment system.

The type of material used in joints and couplings when making cargo transfer connections must be suitable to make a tight seal (see 33 CFR 156.130). The regulations in 33 CFR part 126 require "sufficient" bolts to be used in bolted couplings to prevent leakage. This requirement can be met by complying with 33 CFR 156.130.

The person in charge of transfer operations on the vessel, tank car, or tank truck must report that he is ready for the transfer of cargo. The person in charge of the facility operation, upon receiving this report from the vessel, shall obtain a copy of the declaration of inspection and shall, within reason, personally insure that the condition of the vessel is as stated on the declaration. There is a provision in 46 CFR 35.35–30 whereby the terminal superintendent or his representative shall, on demand, be given an opportunity to satisfy himself that the condition of the vessel is as stated on the declaration.

36–3–20E. COMMUNICATIONS

Maintaining communications between the person in charge of the facility and that of the vessel, tank car, or tank truck is obviously extremely important. The guidance provided in section 36–3–5L of this manual may be applied to the requirement contained in 33 CFR 126.15(o).

The safety rules for self-propelled vessels carrying hazardous liquids (46 CFR part 153) require that the person in charge of cargo transfer operations on board a foreign-flag tankship be readily able to communicate in English with the person in charge of cargo transfer at the transfer facility either directly or through an interpreter who is available to him during the transfer.

36–3–20F. ANNUAL TESTING REQUIREMENTS FOR LIQUID CARGO TRANSFER SYSTEMS

The cargo hose and piping system shall be hydrostatically tested at least once each year to 1–1/2 times its maximum allowable working pressure as defined in 33 CFR 126.15(o)(7)(v). The inherent dangers of pneumatic testing prohibit random substitution for hydrostatic testing. Should no other means of testing be available, its potential risks should be evaluated against no test at all. (See 46 CFR 56.97 for precautions to be taken when conducting pneumatic tests.) Other alternatives available consist of (1) pressurizing the system slowly until relief valves relieve or to maximum pump pressure while continuously monitoring the system for leaks or other abnormal conditions, or (2) substituting a nonreactive liquid for water. However, each time major alterations are made to a system the hydrostatic test should be required.

When considering waivers in this regard, the following points should be considered:

(1) Length of transfer system under evaluation;

(2) Access to transfer system, (buried, elevated, insulated, etc.);

(3) The presence of any relief valves in the system and their routine maintenance schedule;

(4) The age of the system;

(5) The history of the system, e.g., what commodities the system has been used for, major alterations made, etc.; and

(6) The date of the last and/or original hydrostatic test.

PART 36-4—INSPECTION OF FACILITIES OF PARTICULAR HAZARD

36-4-1. GENERAL

A "facility of particular hazard" is defined in 33 CFR 126.05(b). The basic requirements or conditions which must be met are the same as for a "designated waterfront facility" *plus* the requirement to have a warning alarm (see 33 CFR 126.16(b)). The requirement to have a warning alarm does not prescribe what color the emergency rotating flashing light must be; however, red is recommended because it is considered to be the color which would alert most individuals that a hazard is present.

PART 36-5—REGULATING WATERFRONT LNG FACILITIES

36-5-1. GENERAL

Within the U.S. Department of Transportation (DOT), the Coast Guard and the Materials Transportation Bureau (MTB) exercise separate and overlapping safety regulatory authority affecting the siting, design, construction, maintenance, and operation of waterfront liquefied natural gas (LNG) facilities adjoining the navigable waters of the United States. In February 1978, in recognition of each of the party's respective regulatory responsibilities, the Coast Guard and the MTB agreed upon a memorandum of understanding (MOU) to avoid duplication of regulatory efforts regarding waterfront LNG facilities and to maximize the exchange of relevant information.

The MOU is duplicated on plate 36-5-1.1 for the convenience of the reader.

PLATE 36-5-1.1

MEMORANDUM OF UNDERSTANDING
BETWEEN THE UNITED STATES COAST GUARD
AND THE MATERIALS TRANSPORTATION BUREAU
FOR REGULATION OF
WATERFRONT LIQUEFIED NATURAL GAS FACILITIES

I. INTRODUCTION

Within the Department of Transportation (DOT), the United States Coast Guard (USCG) and the Materials Transportation Bureau (MTB) exercise separate and overlapping safety regulatory authority affecting the siting, design, construction, maintenance, and operation of waterfront liquefied natural gas (LNG) facilities adjoining the navigable waters of the United States. The USCG derives its authority over such facilities from the Ports and Waterways Safety Act of 1972 (Pub. L. 92-340, 33 U.S.C. 1221-1227) and the Magnuson Act (50 U.S.C. 191). The regulatory authority of the MTB over these same facilities (as well as non-waterfront LNG facilities) is derived from the Natural Gas Pipeline Safety Act of 1968 (Pub. L. 90-481, 49 U.S.C. 1671 *et seq.*) and the Hazardous Materials Transportation Act (Pub. L. 93-633, 49 U.S.C. 1801 *et seq.*).

In recognition of each of the parties' respective regulatory responsibilities, the USCG and the MTB agree that a memorandum of understanding is needed to avoid duplication of regulatory efforts regarding waterfront LNG facilities and to maximize the exchange of relevant information.

II. RESPONSIBILITIES OF THE PARTIES

For the foregoing reasons, the USCG and the MTB agree to the following division of regulatory responsibilities with respect to waterfront LNG facilities and cooperation in carrying out those responsibilities:

USCG RESPONSIBILITIES

The USCG is responsible for establishing regulatory requirements for—

(1) Facility site selection as it relates to management of vessel traffic in and around a facility;

PLATE 36-5-1.1 (continued)

(2) Fire prevention and fire protection equipment, systems, and methods for use at a facility;

(3) Security of a facility; and

(4) All other matters pertaining to the facility between the vessel and the last manifold (or valve) immediately before the receiving tank(s).

MTB RESPONSIBILITIES

The MTB is responsible for establishing regulatory requirements for—

(1) Facility site selection except as provided by paragraph (1) of the "USCG Responsibilities" set forth in this Memorandum; and

(2) All other matters pertaining to the facility beyond (and including) the last manifold (or valve) immediately before the receiving tank(s) except as provided by paragraphs (2) and (3) of the "USCG Responsibilities" set forth in this Memorandum.

JOINT RESPONSIBILITIES

(1) The USCG and the MTB will cooperate and assist each other in carrying out their respective waterfront LNG facility regulatory enforcement activities; and

(2) The USCG and the MTB, in an effort to avoid inconsistent regulation of similar safety matters (including as between waterfront and non-waterfront LNG facilities), will consult with each other before issuing each Advance Notice of Proposed Rulemaking, Notice of Proposed Rulemaking, and final regulation affecting waterfront LNG facilities.

For the United States Coast Guard

ADM Owen W. Siler
Commandant

Date 7 FEB 1978

For the Materials Transportation Bureau

L. D. Santman
Acting Director

Date FEB 1 1978

CHAPTER 37 -- INSPECTION OF DEEPWATER PORTS

Part 37-1 . . . . General
37-1-1 . . . . Authority
37-1-5 . . . . Availability of Information
37-1-10 . . . . Inspections
37-1-15 . . . . Design, Construction, and Equipment
37-1-20 . . . . Operations and Maintenance

PART 37-1 -- GENERAL

37-1-1. AUTHORITY

The statutory authority for inspection of deepwater ports (DWP's) is contained in the Deepwater Port Act of 1974 (88 Stat. 2126, 33 U.S.C. 1501). Regulations applicable to DWP's are contained in Title 33 CFR, 148, 149, and 150 (Subchapter NN - Deepwater Ports).

37-1-5. AVAILABILITY OF INFORMATION

37-1-5A. UNIT-LEVEL

The cognizant COTP is provided an approved copy of a DWP's operations manual by Commandant (G-WPE). Exemptions granted to the DWP regulations are also held by the cognizant COTP. The COTP shall also maintain records of inspection. Inspection personnel shall be familiar with the DWP regulations, all approved exemptions therefrom, and the approved DWP operations manual.

37-1-5B. DISTRICT-LEVEL

The district commander (oan) maintains records of private aids to navigation which may be used at DWP's.

37-1-5C. HEADQUARTERS

Design plans are available from Commandant (G-MMT-7).

37-1-10. INSPECTIONS

37-1-10A. GENERAL

The license to operate a DWP is issued by the Secretary of Transportation prior to construction, and is valid for 20 years. There is no current requirement for periodical issuance by the Coast Guard of any document similar to a vessel's Certificate of Inspection. However, the Coast Guard is required to ensure that DWP's remain in compliance with applicable laws, regulations, and terms set forth in the license, though no interval between inspections is specified. The COTP shall inspect DWP's as frequently as he deems necessary, based on experience with the port, but at least annually, as is intended for OCS facilities.

All deficiencies discovered during inspections will be reported to the owner. Enforcement of the correction of deficiencies shall be in accordance with the port's license. 33 CFR 150.425 provides for immediate action when required to prevent the discharge or threat of discharge of oil, or to protect the safety of life and property.

Safe operation of the main oil transfer piping is a joint responsibility with the Office of Pipeline Safety Operations (OPSO). OPSO's regional office should be contacted concerning irregularities encountered during inspections.

37-1-10B. EXEMPTIONS

Under specific circumstances, the Commandant may grant a DWP licensee an exemption to operating requirements (see 33 CFR 148.607). The COTP is required to maintain a list of all current exemptions on file. Inspectors shall be aware of all approved exemptions prior to conducting inspections of DWP facilities.

37-1-15. DESIGN, CONSTRUCTION, AND EQUIPMENT

Although a DWP is designed and constructed under Coast Guard monitoring, the inspector shall be alert to any unauthorized alteration(s) to the physical structure, including installation of additional equipment or materials which may be in violation of the DWP regulations.

The following sections discuss those general items where amplification may be helpful. If a check list for a DWP inspection is desired, it should be developed for a specific port.

37-1-15A. STRUCTURAL INSPECTION

The licensee is required to carry out structural inspection of the platform structures. The Coast Guard inspector shall ensure that the licensee's inspection program is current and that any deficiencies noted are corrected in a timely manner.

37-1-15B. SINGLE-POINT MOORINGS

The Coast Guard requires a licensee to obtain an American Bureau of Shipping (ABS) "Interim Class Certificate" or a "Classification Certificate" for a single-point mooring (SPM) prior to operation of the facility. The inspector shall ensure that the licensee maintains each SPM in class, and that the hoses and hawsers of the SPM are inspected in accordance with 33 CFR 150.407 and the DWP operations manual. If the mooring or oil transfer limits are set by readings of mooring load monitors, these devices must operate properly during transfer, in accordance with the approved plans (see Chapter 67, Volume IV of this manual).

37-1-15C. LARGE OIL TRANSFER FACILITIES

Certain deepwater ports may have facilities for being refueled from barges or from bunker service vessels. These facilities shall be inspected in accordance with 33 CFR 154.

37-1-15D. MEANS OF ESCAPE

The approved design of the pumping platform complex provides for a required number of fixed and unfixed means of escape (see 33 CFR 149.421). The inspector shall check the overall condition of and accessibility from each platform level, to the water surface. The inspector shall also be alert to any modifications to the facility which may have degraded or reduced the required number of escape means.

37-1-15E. PERSONNEL LANDINGS AND TRANSFER SYSTEMS

Personnel landings shall be inspected to ensure that they are in good condition and well-maintained. These landings must be provided with adequate guardrails and have sufficient lighting to safely accommodate personnel.

Should the platform have swing-ropes installed, the inspector shall pay close attention to the rope itself and to the chain and shackle usually used for attaching the swing-ropes to the structure. The "Billy Pugh" net or other personnel transfer systems utilized by a crane-equipped platform shall be thoroughly inspected to ensure that the system is well maintained and in good working order. All lines and their attachments, including the crane hook, shall also be checked for general condition. Whenever possible, the inspector should observe and evaluate the personnel transfer system in operation.

37-1-15F. GUARDRAILS, FENCES, AND TOEBOARDS

The inspector shall ensure that all open-sided decks, deck openings, and catwalks have protective devices which meet or exceed the "Safety Requirements for Floor and Wall Openings, Railings, and Toeboards" of the American National Standards Institute (ANSI A12.1, 1973); in addition, each such deck, opening, or catwalk must have toeboards. The inspector shall be alert to any modification which may have resulted in omitting or weakening of these devices.

37-1-15G. FIREFIGHTING EQUIPMENT

Firefighting equipment requirements are listed in 33 CFR 149.451-517 and 33 CFR 150.504-507. 33 CFR 149.402 requires that equipment on board must be approved, even if it is not required by the regulations. The inspector shall verify the DWP records to see that all firefighting equipment maintenance and inspections required by the operations manual have been carried out.

37-1-15H. LIFESAVING EQUIPMENT

Lifesaving equipment requirements are listed in 33 CFR 149.521-537 and 33 CFR 150.508. Again, 33 CFR 149.402 requires that equipment on board must be approved, even if it is not required by regulations. NVC 2-63 contains a guide on the inspection and allowable repairs to lifesaving equipment. Additional information on lifesaving equipment can be found in Chapter 31 of this manual.

37-1-15I. LEAK AND MALFUNCTION DETECTION SYSTEM

The inspector shall ensure that all inputs to this system are operational and that the alarm levels are set in accordance with the operations manual.

37-1-15J. EMERGENCY POWER SYSTEM

Each pumping platform complex is required to have an emergency power source capable of providing sufficient power to operate the following equipment for a continuous eight-hour period:

- Emergency lighting circuits;
- Aids to navigation equipment;

- Communications equipment;
- Radar equipment;
- Alarm systems; and
- Electrically operated fire pumps and other emergency electrical equipment/systems, as specified in the operations manual.

The inspector shall ensure that this emergency power system is operational by requiring it to be operated under load.

37-1-20. OPERATIONS AND MAINTENANCE

DWP operation manuals cover many areas of interest to the inspector. Sections on maintenance, emergencies, and safety shall be reviewed so that implementation of procedures outlined in these sections can be verified. Machinery systems shall be exercised to the greatest extent possible, and emergency drills should be held.

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MARINE SAFETY MANUAL (CG-495)

CHAPTER 38—ARTIFICIAL ISLANDS AND STRUCTURES ON THE OCS

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PART 38-1--INSPECTION OF ARTIFICIAL ISLANDS AND FIXED STRUCTURES ON THE OCS

38-1-1. AUTHORITY

38-1-1A. The statutory authority for the inspection of artificial islands and fixed structures is contained in section 4(e)(1) of the Outer Continental Shelf Lands Act (43 U.S.C. 1333).

38-1-1B. The regulations applicable to the inspection of lifesaving appliances, firefighting equipment, etc., are contained in title 33 CFR parts 140-147 (Subchapter N-Artificial Islands and Fixed Structures on the Outer Continental Shelf). The regulations concerning aids to navigation are contained in 33 CFR part 67. All platforms which are erected on or over the seabed and subsoil of the Outer Continental Shelf and in the waters under the jurisdiction of the United States are subject to 33 CFR 670.

38-1-1C. The Outer Continental Shelf Lands Act also gives the Coast Guard regulatory authority over foreign flag mobile offshore drilling units which, as foreign vessels on the high seas, are not subject to U.S. vessel inspection regulations. They are, when engaged in drilling operations, "mobile platforms" under 33 CFR 140.10-5. Foreign flag mobile offshore drilling units engaged in drilling operations on the OCS should be boarded and inspected in a manner similar to manned fixed structures to ascertain that their construction, arrangement and safety equipment provide a level of safety equivalent to that required by the regulations in 33 CFR 140-147. Retrofitting with Coast Guard approved equipment is not required. Installed lifesaving and firefighting equipment is acceptable as long as it is in good and serviceable condition.

▼*38-1-1D.* 33 CFR part 135, subpart C, details the requirements for the maintenance of certificates of financial responsibility for offshore OCS facilities.

38-1-5. COOPERATION WITH OTHER BRANCHES AND AGENCIES

38-1-5A. DISTRICT AIDS TO NAVIGATION BRANCH

District aids to navigation branches keep records of platform identifications, locations and navigational aids. They may also have inspection personnel to check the navigational aids on the platforms in their area. Close liaison with the district office may provide aid in obtaining transportation to the platforms and may otherwise prove cost-beneficial.

38-1-5B. U.S. GEOLOGICAL SURVEY (U.S.G.S.)

The U.S.G.S. is responsible for the inspection of drilling, well and production systems safety equipment. This encompasses well shut-in, blowout prevention, and other systems. The U.S.G.S. has continuous, regular inspection programs for all artificial islands and fixed structures on the Outer Continental Shelf. Close liaison with this agency may provide a means of transportation to the platforms, and may be otherwise cost-beneficial and helpful.

38-1-10. TYPES OF PLATFORMS

38-1-10A. GENERAL

Platforms encountered will range in size from a single piling structure with a few square feet of walkway to complexes of five or more platforms interconnected by catwalks. The complexity will also vary from a simple one-or two-well production platform to a relay platform on which twenty or more pipelines converge and natural gas is compressed, cleaned, and sent to shore, or on which a number of oil lines converge into one.

38–1–10B. MANNED PLATFORMS AND COMPLEXES

Crew sizes on manned platforms will vary from a two- or three-man crew on an isolated production platform to a large complex with quarters for ninety or more persons. Manned complexes may be set up in such a way that one platform is living area only, a second may be for power generation, another for gas compression, pipeline junction, or oil storage. Personnel living on a platform may additionally control and service any number of small unmanned outlying platforms. Smaller complexes may have some of the aforedescribed functions combined on one or two platforms.

38–1–10C. UNMANNED PLATFORMS

Unmanned platforms vary in complexity as do manned platforms. The equipment found on them may consist of all or part of that found on manned platforms.

38–1–10D. PLATFORMS ENGAGED IN DRILLING OPERATIONS

Platforms engaged in drilling operations will typically have had placed on them drilling equipment consisting of one or more rigs containing the derrick, power generation equipment, mud pumps and mixing equipment, living quarters and other equipment necessary to the drilling operation. These rigs will remain in place for periods of time ranging from several months to several years.

Drilling rigs may be placed on either manned or unmanned structures. On manned structures where new wells are being drilled there may be two crews, one engaged in drilling and the other continuing production from old wells on that, and possibly on outlying, platforms. In this case there will be two separate groups with whom to deal.

On platforms where these rigs are in place, particular care should be taken to insure that their placement has not blocked or obstructed access to required emergency equipment.

38–1–15. SAFETY EQUIPMENT INSPECTIONS

The frequency of inspections of artificial islands is to be determined by the OCMI in whose jurisdiction the structure is located. The inspections shall address lifesaving, firefighting, and emergency equipment such as the OBA, first aid material, etc., to the extent necessary to assure regulatory compliance and satisfactory condition of equipment. When deemed necessary by the inspector, emergency drills may be required. When Whittaker Capsules and/or covered lifeboats are installed, drills should be conducted and witnessed by the inspector. If possible, boats should be launched and operated in order to insure crew familiarity with the equipment. This is particularly valuable since the crews on these structures are drilling personnel and not seamen.

Deficiencies noted during inspections shall be reported to the structure owner for correction as soon as practicable.

38–1–20. CONSTRUCTION AND ARRANGEMENT

38–1–20A. ESCAPES

The primary means of escape shall be checked for overall condition, location, and accessibility from the uppermost platform level (excluding the heliport) to each intermediate level and to the water surface. Each outlying platform of a manned platform complex should have at least one primary means of escape to the water surface. Catwalks leading to an adjacent platform which has a primary means of escape shall be considered as the second required primary means of escape for each of the platforms. Special care should be taken in inspection of the primary means of escape on platforms on which drilling units have been placed, to insure that the escapes have not been blocked by the drilling structure. (See 33 CFR 143.05.)

The secondary means of escape, when installed, shall also be inspected for condition, location and accessibility. Swing ropes used to transfer personnel to and from boats are not counted as secondary means. These ropes do not generally extend to each working level or are accessible only with difficulty.

38-1-20B. MEANS OF ACCESS AND EGRESS

Personnel landings should be checked for condition and landings should be well lighted. The lights are often left burning continuously and they should be checked to insure that they are all working.

Attention should be paid to the swing ropes used to transfer personnel to and from boats. The rope should be in good condition but attention should also be paid to the chain and the shackle usually used to attach it to the structure.

Close attention should also be paid to the "Billy Pugh" net. This net is used on crane-equipped platforms to transfer personnel to and from boats. The net consists of two steel circular pipes approximately 5 ft. in diameter to the outside of which is attached a 6-inch diameter ring of foam secured by stainless steel bands and covered with canvas. The center of this ring is interlaced with rope covered by a canvas sheet. This lower ring is connected to an upper ring of smaller diameter by 12 load lines of 3/4 inch polypropylene. Areas to inspect closely are the lines and their attachments to the rings and, by turning the bottom ring over, the condition of the stainless steel bands retaining the foam. The foam ring is used to stand on by personnel being hoisted to or from the platforms, and the bands must be in good condition. Similar attention should also be given to other types of transfer systems.

Heliport perimeter guards should be checked to assure that the wire mesh is attached to the framework in such a manner that it will not be torn loose if a man were to step or fall onto it.

38-1-20C. LADDERS AND RAILINGS

Ladders and railings should be checked to insure that there are no gaps in them. This is particularly important on structures on which platform drilling units have been installed, because the installation of these units often requires alteration of railings and ladders to fit the unit to the structure.

▼38-1-25. INSPECTION OF LIFESAVING EQUIPMENT

38-1-25A. GENERAL

NVC 2-63 contains a guide for the inspection and repair of lifesaving equipment and shall be used by the inspector as a guide of recommended procedures. Additional information on lifesaving equipment inspection can be found in chapter 31 of this manual.

38-1-25B. LIFEBOATS OR ALLOWABLE SUBSTITUTES

(1) Whittaker Survival Capsules and covered lifeboats are often found installed as alternates to the required lifefloats. It should be remembered that even though a single capsule or lifeboat capable of accommodating all persons aboard is installed, a second lifefloat or substitute is required by the regulations.

(a) Although required equipment in the boats is minimal, most will be equipped as if they were in ocean service. If nonrequired equipment is aboard it should be up-to-date and in good condition.

(b) Davits, winches and falls on these installations shall be visually inspected for signs of deterioration or defects. The equipment should be operated and all systems tested during the emergency drills. No periodic weight test is required by the regulations; however, persons in charge should be advised that a periodic weight test is recommended.

(c) Weight tests of 1.1 times the working load of new capsules or boat installations are advised, and whenever information of a new installation is received, the platform owner should be notified to arrange for such a test.

(d) Problem areas associated with the inspection of Whittaker capsules and covered lifeboats are covered under Emergency Drills, section 38-1-35E.

(2) When inflatable liferafts are installed it should be noted that an added length of painter line may need to be attached to the 100-foot line packed in the raft. This will depend on the particular platform and how high out of the water the raft is stored.

38-1-25C. PERSONAL FLOTATION DEVICES (PFD)

One Type I PFD is required on manned platforms for each man aboard. This also applies to unmanned platforms whenever anyone is aboard.

38-1-25D. RING LIFE BUOYS

(1) Four ring life buoys with attached waterlights are required for each manned platform, one on each side of the platform, in *accessible* locations. In some cases, due to platform design, this may not be possible, and a suitable location for one or more of the buoys will have to be found.

(a) Railings of ladders leading down to the water from the lowest working level are not considered to be in "accessible" locations. The ring life buoys should be installed on the platform *working* levels.

(b) If lines are attached to the ring buoys, care should be taken to assure that these lines are not tied to the platform.

(c) Manned complexes of platforms may be permitted less than four ring life buoys on platforms other than the quarters platform if, in the opinion of the OCMI, the safety of the personnel aboard will not be adversely affected.

(2) The ring life buoys required on unmanned platforms *whenever anyone is aboard* will not be required to be permanently mounted on the rails but will be placed in accessible and visible locations at the rails ready for immediate use.

38-1-25E. LITTERS

Acceptable litters may vary from the standard "Stokes" type to specially designed litters which can be used with the helicopters that transport personnel to and from the platforms.

38-1-25F. EXCESS LIFESAVING EQUIPMENT

Equipment provided in excess of the regulations shall be of approved type and maintained in good and serviceable condition.

▼38-1-30. INSPECTION OF FIREFIGHTING EQUIPMENT

38-1-30A. IDENTIFICATION OF APPROVED EXTINGUISHERS

Approved extinguishers shall be identified in accordance with the regulations in 46 CFR part 145.

38-1-30B. REQUIRED PORTABLE AND SEMI-PORTABLE EXTINGUISHERS FOR MACHINERY SPACES

Extinguishers are required for gas-fired and oil-fired boilers in machinery spaces. Although boilers, as such, are rarely found aboard offshore structures, glycol heaters very often are. These are usually firetube-type heaters and are used to heat a glycol mixture. Well gas may be passed through this mixture to remove moisture from the gas prior to putting the gas into a pipeline to shore. The heaters are generally low-pressure systems but are gas-fired. (See 33 CFR table 145.10(a).)

38-1-30C. NON-APPROVED PORTABLE AND SEMI-PORTABLE EXTINGUISHERS

On most platforms, the number of fire extinguishers found will be far in excess of that required by the regulations. Much of this excess equipment may be of non-approved types. As long as the non-approved extinguishers are in excess of the requirements and regulatory requirements are met by using approved equipment, no requirement to replace the non-approved equipment with approved types will be issued. The non-approved equipment should, however, be inspected, weighed and tested at the same interval as the required extinguishers.

38-1-30D. NON-REQUIRED EQUIPMENT

Although not mentioned in the regulations, many platforms have installed fire pumps, fire stations, and aqueous film-forming foam systems as well as hard-piped dry-chemical extinguishing systems. All this and related equipment should be checked for overall serviceability. If possible, fire pumps and their drive engines should be operated. All discrepancies found during these inspections should be brought to the attention of the owner's representative.

38-1-30E. REQUIRED EQUIPMENT ON UNMANNED PLATFORMS

Whenever anyone is working on an unmanned platform the firefighting requirements are the same as those for a manned platform.

▼38-1-35. OPERATIONS

38-1-35A. PERSON IN CHARGE

(1) The title of the person in charge of a structure will vary depending on the type of operation it is engaged in. The following examples are some of the more commonly encountered titles:

(a) On a large manned platform which manages the output of a number of scattered satellite platforms, the person in charge will generally be referred to as the "field foreman."

(b) A small platform off by itself with only three or four persons living on it may have a "head gauger" in charge.

(c) A platform on which a modular drilling rig is installed will have two persons with whom you have to deal: the "tool pusher" will be in charge of the drilling rig and a "company man" will have responsibility for the platform equipment. In this case, two different lists of deficiencies may be required, one for the drill rig and one for the platform. Generally in this type of situation the tool pusher will have the ultimate responsibility for drills and safety during drilling operations.

38-1-35B. STRUCTURE IDENTIFICATION

The recording of the identification marks required by 33 CFR 146.01-5 is done by the aids to navigation branch of the district office in which the artificial island is located. The mark visible from the air that is required on heliport-equipped structures would, whenever possible, be located on the heliport deck itself.

38-1-35C. GENERAL ALARMS

General alarm systems may consist of bells and/or sirens or whistles used to call personnel to their emergency stations, and shall be clearly audible in all parts of the platform under all conditions of operation.

On platforms with installed general alarm systems onto which modular drilling rigs have been placed, particular care should be taken to insure that the system belonging to the drilling rig is tied in with the platform system so that activation of one will automatically cause activation of the others.

The required *fire signal* shall be an intermittent signal on the general alarm for at least 15 seconds and the *abandon platform signal* shall be a continuous ringing. Signals for other emergencies such as blowout or man overboard may be designated by the owner and shall be readily distinguishable from the fire and abandon signals.

38-1-35D. STATION BILL

The station bill should generally be the same type as that found on inspected vessels.

38-1-35E. EMERGENCY DRILLS

(1) Emergency drills shall be held when deemed necessary by the OCMI, and generally during periodic inspections whenever Whittaker Capsules, lifeboats or covered lifeboats are installed.

(2) During drills, the capsules or boats should be launched and recovered when sea conditions permit. There are several areas of Whittaker Capsule operation to which the inspector should pay close attention during drills:

(a) Methods for launching a capsule by a single-part wire rope fall vary according to the equipment used for paying out the fall under the driving force of the capsule's weight. Single-drum winches and hydraulic ram-block and fall assemblies are approved for this purpose. For the ram installation (approval No. 160.015/95), the launching steps involving a valve, pelican hooks, safety pins, and launch release handles differ from those applying to the single-drum winches. (Some of the latter require removal of a safety pin before the winch brake can be released; others permit the launch release handle to be operated immediately from the capsule's hatch.) The valve handles, safety pins, and release handles of all installations should be clearly marked with red tags or made conspicuous with contrasting paint. Retrieval of a capsule with any installation requires electric power, although the single-drum winches have hand cranks for hoisting the capsule to its stowage position. Specific details for the launching and retrieval of any capsule are given in Whittaker instruction manuals found on the drill rig, and are backed up by instruction decals posted at the launching station.

(b) The release mechanism for the Rottmer hook is different from those used on covered lifeboats and conventional lifeboats. The pivoting collar that holds the hook in place is turned by a ratchet-operated mechanism inside the capsule. A small trip-lever on the handle controls the turning direction of the collar. This lever must be pushed in the direction away from the handle's handgrip in order for the Rottmer hook to be released. After the capsule has been recovered following a drill, the Rottmer hook collar has been turned completely to its stop, and the safety pin has been inserted in the ratchet handle, the trip lever should be reset so that is again in position ready for release.

(c) A sprinkler system is installed on the exterior of the capsules to provide cooling of the shell during use in or near a fire. On older capsules, water is supplied to the sprinkler system by a hand-operated bilge pump. Two valves, one above the pump and the other below near the floor, control the flow of water through the system. Normally, both valve levers should be aligned vertically to allow sea water to be drawn into the system and out through the sprinklers. To pump the bilge, both levers should be horizontal. Personnel should know how to prime the bilge pump. On newer capsules, the sprinkler system water is supplied by an engine-driven pump controlled by a lever on the control panel. A separate portable hand bilge pump is supplied.

(d) Capsules are equipped with an air regeneration system for use in areas of contaminated air. This system can provide air for a period ranging from twenty minutes to one hour, depending on the size and number of canisters installed. Proper operation of the system requires closure of all vents, opening of the seals on the canisters, and proper attachment of the forced ventilation hoses to the canisters. The canisters should be checked during the inspection to insure that none of the seals is broken. Canisters with broken seals must be renewed. Fifty-passenger capsules also have a supply of bottled air for the engine. This air supply assures that the engine will not be starved for air when the capsule is operating in a fire. It is controlled by a valve on the control panel and contains enough air for the engine to operate for over five minutes at full throttle.

(e) A capsule towing exercise should be conducted during drills when the capsule is launched and a towing vessel is available. Towing should always be done using the padeyes on the capsule flange, or a pre-rigged towing attachment connected to one or more of the padeyes. Special towing attachments on the flange of some older capsules with a large stabilizer skirt can also be used. *Under no circumstances is a capsule to be towed or secured to another vessel by the Rottmer hook.* The Rottmer hook is to be attached only to the wire rope fall on a capsule-launching platform. When towing exercises are not conducted, the crew should be questioned about their knowledge of proper towing procedures.

(f) During recovery of the capsule during drills, the inspector should insure that the winch operator pays close attention to the limit switches. The limit switch arms can be damaged or bent, and if this occurs, the winch may not stop automatically before the capsule is brought hard against the stops. If the winch or hydraulic ram continues to pull when the capsule is against the frame, major damage to the capsule and personnel injury may result.

(g) Another problem that can be encountered during capsule recovery is improper cable alignment on the winch drum. Capsule movement may cause the cable to jump one or more grooves on the drum. When this occurs, one of two problems may result, depending upon the particular drum design. When the drum has a large flange at the end, the cable will bunch up at the flange, and the capsule will have to be lowered and recovered to correct the problem. On drums with a small flange at the end, the cable may jump the end of the drum and be pinched between the drum and the winch housing. In both cases, serious cable damage can result. Operator alertness can prevent these problems.

(3) Covered lifeboats also present some operational differences as compared to conventional lifeboats.

(a) The winch brake control is located so that it is operated by a person inside the boat; however, safety lines at each end of the boat must be released by a person before he enters the boat. On Marine Safety (MASECO) installations, a trip line at each end of the boat must be pulled, releasing safety hooks which engage the lifting eyes on the falls. On Watercraft/Schat installations, a more conventional gripe is used around each end of the boat hull. These are released simultaneously by releasing a single pelican hook located near the boat entry point on the platform either overhead, or in front of the boat entrance.

(b) Covered lifeboats are equipped with a bottled air system to provide breathing air for the occupants and air for running the engine when the boat is operating in a fire. Enough air is provided for over five minutes of operation at full throttle. The air bottles are mounted under lifeboat thwarts or benches, and the control valves are located near the bottles.

(c) Covered lifeboats have a sprinkler system installed on the exterior to provide cooling of the shell during use in or near a fire. On older covered lifeboats, the water pump is driven by air from the air bottles, so that when the air system is in use, sea water is being pumped through the sprinkler system. This limits the air system and sprinkler system to simultaneous use. On newer covered lifeboats, the sprinkler pump is driven by the engine, and has a manual control to engage and disengage the pump.

(d) When the boats are linked to the falls for recovery after a drill, an attempt should be made to connect the forward and after falls simultaneously.

There should also be enough slack in the falls to compensate for any existing swell condition.

(e) During recovery of the boat during a drill, the inspector should assure that the winch operator pays close attention to the limit switches. The limit switch arms can be damaged or bent, and if this occurs, the winch may not stop automatically before the boat is brought hard against the stops. If the winch continues to pull when the boat is against the frame, major damage to the boat and personnel injury may result.

(f) Another problem that can be encountered during boat recovery is improper cable alignment on the winch drum or sheaves. If the cable jumps grooves in the drum or comes out of a sheave, major damage to the cable can result. The movement of the cable out of a drum groove or sheave can cause sharp movement in one end of the boat, resulting in motions that can be distressing to person inside the boat. Winch operator alertness can prevent these problems.

(4) When capsule or boat drills are completed, the craft should be immediately prepared for its next use. Air bottles and hydraulic accumulators should be fully pressurized. Fuel tanks should be full or nearly full. The throttle or transmission control should be in a neutral position, and all engine-starting controls which can be pre-set should be in position for starting. Any water in the bilges should be drained and grease or oil should be removed from stepping or walking surfaces. Capsule release gear trip levers should be set as described in subparagraph 2(b) above. The person in charge of preparing the boat or capsule for its next use should have a checklist of items that lists the actions and checks required.

(5) During drills it should be required that all service personnel become involved. These people are not directly involved with drilling the well, but come aboard at various stages of the operation to test the well, retrieve equipment lost in the well, clean or perforate the well, or perform any number of other specialized operations. Since these people normally are not aboard any one platform for long periods of time, it is essential that they become familiar with the emergency procedures of the platform they are aboard.

(6) When conducting drills on platforms on which drilling operations are being conducted, the inspector should not normally require that drilling operations be shut down to conduct the drill. Sufficient personnel may be exempted to keep drilling operations underway. The number of such personnel may vary, but will generally be six or seven.

▼38–1–40. REPORTS

38–1–40A. DEFICIENCIES

Deficiencies noted during the inspection shall be recorded, utilizing form CG-835 and follow-up letters in the same manner as for inspected vessels. In the case of modular drilling units installed on fixed structures, separate CG-835's and letters shall be prepared for the drilling contractor and the platform owner.

38–1–40B. INSPECTION FORMS

Plates 38–1–40B.1 through .4 are samples of recommended inspection forms for manned and unmanned artificial islands.

▼38–1–45. TRAINING AIDS

The increase in offshore oil drilling activity which has been experienced throughout the United States is expected to continue in the future. In order to meet the new inspection demands caused by this offshore activity, all MSO's and MIO's will require additional personnel training, and all unit on-the-job training programs should be expanded to include this rapidly growing industry. The Petroleum Extension Service (PETEX) has available for purchase some excellent training aids including publications, slide-tape programs, and motion picture films. A

PLATE 38-1-40B.1

SAMPLE INSPECTION RECORD OF MANNED ARTIFICIAL ISLAND OR FIXED STRUCTURE ON THE OUTER CONTINENTAL SHELF

COMPANY ______________________ DATE ________________

STRUCTURE DESIGNATION ______________________

NUMBER OF PLATFORMS IN COMPLEX ______________

1. Time of inspection		
2. Owners' designation if different than above		
3. Name of lessee		
Name of offshore area		
Number of block		
Designation (if any)		
4. Above Information marked in 12" vertical block Letters and Numbers on diagonal corners of structure and on heliport		INIT.
5. Owner/Address		
6. Operator/Agent/Address		
7. Structure Type/production, drilling, quarters etc.		
8. Persons living and accom. on	Capacity Number aboard	
9. Person in charge/title		
10. Primary Means of Escape Fixed structures/fixed ladders		
11. Secondary Means of Escape/Type		
12. Personnel Landings/Transfer Facilities/Landings/Guards/Rails Illumination for Landings		
13. Guards/Rails Perimeter of floors, decks and openings. Unprotected perimeter of helicopter deck		
14. Catwalks/Stairways/Guards/Rails		
15. First Aid Kit		
16. Stokes Litter or substitute		

<table>
<tr><th colspan="5">PLATE -38-1-40B.2</th></tr>
<tr><th colspan="3"></th><th>REMARKS</th><th>INIT.</th></tr>
<tr><td colspan="3">17. Emergency Communications Equipment
Radio and / or wire telephone or Microwave</td><td></td><td></td></tr>
<tr><td colspan="3">18. Lifepreservers, number proper stowage
Markings</td><td></td><td></td></tr>
<tr><td colspan="3">19. Workvests, number
Separate stowage</td><td></td><td></td></tr>
<tr><td colspan="3">20. Ring Life Buoys, number
Electric Waterlight w/lanyard
Fitted in bracket
Arrangement on platform
Markings</td><td></td><td></td></tr>
<tr><td colspan="3">21. Lifefloats or Allowable
Substitutes</td><td rowspan="4"></td><td rowspan="4"></td></tr>
<tr><td>ITEM</td><td>NUMBER</td><td>CAPACITY</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="3">Capsule or Boat Serial No.'s
Location (outboard sides).
Markings (1½")</td></tr>
<tr><td colspan="3">22. Lifefloat Equipment
Painter
Electric waterlight
Paddles (2)</td><td></td><td></td></tr>
<tr><td colspan="3">23. Inflatable Liferafts
Painter Length</td><td rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td>Manufacturer</td><td>Capacity</td><td>Service Date</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="3">24. General Alarm System
Audible in all parts of platform
Markings/bell and switch 1" red</td><td></td><td></td></tr>
<tr><td colspan="3">25. Emergency Drill Held ____________
Records</td><td>Comments:</td><td></td></tr>
<tr><td colspan="3">26. Fog Signal/Operational/Type</td><td></td><td></td></tr>
<tr><td colspan="3">Obstruction Lights
Number/Operational</td><td></td><td></td></tr>
</table>

PLATE 38-1-40B.3

REMARKS

27. Fire Fighting Equipment

		REQUIRED		ON HAND	
LOCATION	REQUIREMENT	NO.	CLASS	NO.	CLASS
Comm. Corridors	1 AI I/ 150ft.				
Radio Room	1 CI I/near exit				
Sleeping Accom.	1 AI I/ over 4 bunks				
Galley	1 B/CI I ea. 2500 sq. ft.				
Store Rooms	1 AI I ea. 2500 sq. ft.				
Boilers/ glycol heaters	2 BI I 1 BIV(if no fix CO2)				
Generator Room	1 BI I ea. eng.				
Compressor Room	1 BI I ea. eng.				
Pump Room	1 BI I ea. eng.				
Ele mtrs/ Gen (open)	1 CI I ea. 2 mtr				
Int. Comb. Eng. in open	1 BI I ea. 3				

Date discharged, refilled weighed ____________________

Hydrostatic test date ____________

Non-required Equipment

Hose stations __________ Type Pump __________ Pump Drive __________

Light Water Stations __________

Fire extinguishers in non-required locations

No. Type Location

28. In my opinion all provisions of the applicable regulations have been complied with and the emergency equipment is in good condition and satisfactory in every respect.

____

Signature of USCG Inspector

29. Additional Remarks

PLATE 38-1-40B.4
SAMPLE INSPECTION RECORD OF UNMANNED ARTIFICIAL ISLAND OR FIXED STRUCTURE ON THE OUTER CONTINENTAL SHELF

DATE: ______

STRUCTURE DESIGNATION ______

Field Name or Owner's Designation (If different) ______

Structure Type: ______ Persons aboard at time of inspection; ______

Owner's Representative Present: ______ Title ______

Owner's Address: ______

______ Identification Markings: Structure: ______ Helo. Deck ______

______ Means of Escape: ______ Primary (1reqd.), Secondary ______ (1/Ten POB

______ Work Vests: Number ______ Stowage ______

______ Life Preservers: Number ______ Stowage ______ (1/Man if Crews Working 24 Hrs.)

______ Ring Life Bouys: Number ______ Equip. ______ Stowage ______ (4 reqd. If Crews Work 24 Hrs.)

______ Life Floats: Number ______ Cap. ______ Equip. ______ Stowage ______ (None reqd.)

______ Guard/Rails:

______ Fog Signal: Operational ______ Type ______

______ Obstruction Lights: Number ______ Operational ______

______ Fire Extinguishers:

NO. TYPE LOCATION

REMARKS:

In my opinion all the provisions of the applicable Coast Guard regulations have been complied with and the above listed emergency equipment is in good condition and satisfactory in all respects.

______
Signature of USCG Inspector

catalog, listing all of their training aids, may be obtained by writing:

The University of Texas at Austin
Division of Extension
Industrial and Business Training Bureau
Austin, TX 78712

Involved units may also be put on the mailing list for the PETEX Training Newsletter, which is available through the courtesy of the American Petroleum Institute (Production Department) and the International Association of Drilling Contractors. Contact the:

Petroleum Extension Service
Drawer S
University Station
Austin, TX 78712

Only those units presently engaged in offshore oil activity and those anticipating activity in the immediate future should request this information.

MARINE SAFETY MANUAL (CG-495)

PART 38–2—INSPECTION OF MANNED SUBSEA STRUCTURES

(To be developed.)

CHAPTER 39—BOARDING OF COMMERCIAL VESSELS FOR PORTS AND WATERWAYS SAFETY AND POLLUTION PREVENTION

CONTENTS

Part 39–1	Boarding of Commercial Vessels for Ports and Waterways Safety and Pollution Prevention—General
39–1–1	Introduction
Part 39–2	Implementation of the Pollution Prevention Regulations Concerning Vessel Design and Operations
39–2–1	General
39–2–5	Guidelines for Implementing the Regulations Contained in 33 CFR Part 155
Part 39–3	Enforcement of the Navigation Safety Regulations
39–3–1	General
39–3–5	Guidelines for Implementing the Regulations Contained in 33 CFR Part 164

PART 39-1—BOARDING OF COMMERCIAL VESSELS FOR PORTS AND WATERWAYS SAFETY AND POLLUTION PREVENTION—GENERAL

39-1-1. INTRODUCTION

The purpose of this chapter is to provide guidance to field personnel concerning the intent of certain regulations promulgated under the authority of the Ports and Waterways Safety Act and pollution prevention statutes such as the Federal Water Pollution Control Act.

The information that follows in each part of this chapter is self-explanatory.

PART 39-3—ENFORCEMENT OF THE NAVIGATION SAFETY REGULATIONS

39-3-1. GENERAL

This part provides guidance for the implementation of the Navigation Safety Regulations contained in 33 CFR Part 164.

Section 104 of the Ports and Waterways Safety Act (33 U.S.C. 1224) authorizes the issuance of reasonable rules, regulations, and standards necessary to implement the Act. Accordingly, the regulations in 33 CFR Part 164 prescribe the rules for navigation procedures, preliminary tests, and minimum equipment for vessels of 1600 gross tons or more when operating on the navigable waters of the United States, except the Panama Canal and St. Lawrence Seaway.

Most vessels follow proper procedures, have the necessary equipment, and keep their equipment operating properly. It is those vessels that do not follow proper procedures or do not have properly operating, necessary equipment that create a hazard. Vessel casualties such as those involving the M/V TORREY CANYON, M/V TAMANO, S/S OREGON STANDARD, and S/S ARGO MERCHANT might not have occurred if proper navigation procedures had been followed or if the vessels had had essential equipment that was operating properly.

The purpose of the Navigation Safety Regulations (33 CFR Part 164) is to reduce the risk of future casualties by requiring, for certain vessels, that proper navigation procedures are followed, that necessary equipment is on board, and that all essential equipment is operating when the vessels are on or in the navigable waters of the United States.

This part of the manual discusses various aspects of the Navigation Safety Regulations in order to facilitate understanding and to standardize their implementation. Each section relates to specific sections in the Code of Federal Regulations.

39-3-5. GUIDELINES FOR IMPLEMENTING THE REGULATIONS CONTAINED IN 33 CFR PART 164

A. 33 CFR 164.01 - APPLICABILITY.

The term "navigable waters of the United States" as used in this section refers to the territorial sea and internal waters of the fifty states, the District of Columbia, Puerto Rico, the territories and possessions of the United States, and the Trust Territory of the Pacific Islands.

B. 33 CFR 164.11 - NAVIGATION UNDERWAY: GENERAL.

This section of the regulations provides the mariner with navigation requirements considered by the Coast Guard to represent the minimum prudent navigational practices necessary to reduce the probability of marine casualties. The following guidance is provided to clarify the requirements of 33 CFR 164.11:

(1) 164.11(a) - The intent of this regulation is that the wheelhouse be "constantly manned," and that the functions of directing and controlling the movement of the vessel and of fixing the vessel's position be accomplished. The mention of specific manning levels was intentionally avoided. Proper accomplishment of the required tasks indicates adequate manning.

(2) 164.11(b) - The word "competent" as used in this regulation means more than qualified through licensing and certification. It also means the physical and mental capacity to do the job at the actual time the person performs the duty. The master generally has little control over the hiring of personnel, but he can insure that his watchstanders are sober, rested, and in good health.

(3) 164.11(c) - The frequency of fixes was deliberately left unspecified because circumstances vary widely. The thrust of this regulation is to require ship's personnel to fix their position periodically so that the master *and* officer controlling the vessel, whether a pilot or ship's officer, will know the vessel's true positions rather than where the vessel is thought to be.

(4) 164.11(d) - This regulation is not a requirement for specific navigation equipment but necessitates the use of the navigational equipment that is on the vessel plus the use of geographic reference points and hydrographic contours for fixing positions. The intent is to minimize the practice of navigating exclusively by "seaman's eye."

(5) 164.11(e) - Self-explanatory.

(6) 164.11(f) - This regulation requires that the threat posed by each closing contact be evaluated. It does not suggest what action should be taken once a contact is evaluated nor does it preclude the conning officer from making his own evaluations.

(7) 164.11(g) and (h) - The intent of these regulations is that the person directing the vessel's movement does whatever is necessary to insure that his orders are being executed correctly, such as observing the helmsman turning the wheel, observing the rudder angle indicator, and observing the engine order telegraph so that the person can respond *immediately* to correct any error being made. Positive indications such as the movement of the vessel's head, change in vessel speed, or engine vibrations may not occur in time for correction of an error, especially on "very large" vessels.

(8) 164.11(i) - The intent of this regulation is that a person directing the movement of a vessel be aware of the deviation and variation of the magnetic compass and of gyrocompass error. Regular compass and/or celestial comparisons, combined with reasonably current deviation tables, meet the requirement of this regulation.

(9) 164.11(j) - This regulation requires only that the person be in the wheelhouse at all times. It is not necessary that he be in a "steering position" when the vessel is on automatic pilot. The word "competent" is as described in 164.11(b) above. (Note that the notation to this regulation is not exact. 46 U.S.C. 672(a) has a proviso: " . . . and that in narrow and crowded waters or in low visibility none below the rating of able seaman shall be permitted at the wheel. . . .")

(10) 164.11(k) - Some "abnormal circumstances" may be obvious, such as list, trim, unusual bridge equipment or layout, etc. Some may be less obvious, such as shaft vibration at certain RPM, restricted rudder travel or slow follow-up, limited backing ability because of fuel in use, etc. The intent of this regulation is to avoid unpleasant surprises.

(11) 164.11(1), (m), and (n) - The intent of these regulations is that the person directing the movement of the vessel know as much about current velocity and direction, predicted set and drift, and tidal state for the area to be transited as is possible, and that this available data be used.

(12) 164.11(o) - The intent of this regulation is that the anchor be ready for use if necessary, such as when a vessel is operating in narrow channels, confined or congested waters, working around docks, etc. "Ready for letting go" means that the anchor is rigged for quick use. It does not mean that the anchor should be walked out nor that release controls require manning.

(13) 164.11(p) - This regulation requires only that the person directing the movement of the vessel take into consideration the factors numbered (1) through (8) in this regulation when underway in the navigable waters of the United States.

(14) 164.11(q) - The intent of this regulation is simply that the results of the test conducted as required by 33 CFR 164.25 be recorded in an *official* log of the vessel to attest to the fact that the tests were conducted and to record deficiencies.

(15) 164.11(r) - Self explanatory.

C. 33 CFR 164.15 - NAVIGATION UNDERWAY: CONFINED OR CONGESTED WATERS.

These are special regulations for the increased hazards of navigating in confined or congested waters. However, the practical application of this section will not occur until specific geographic areas in which they would apply are included under 33 CFR 164.16. Confined or congested waters will be defined by name in separate rulemaking actions.

(1) 164.15(a) - This regulation requires vessels to be ready to "answer bells."

(2) 164.15(b) - The intent of the regulation is to have someone in the engineroom and, if the main engine control station is not located in the engineroom, a second person at the main engine control station. On a fully automated vessel with full bridge control of engines, the intent of the regulation cannot be served by bridge manning alone.

(3) 164.15(c) - This regulation requires a higher level of readiness than 164.11(o) because confined or congested waters allow less reaction time. If there is remote control of anchors, the intent is met by having a person near the remote control so that there will be no delay in manning.

(4) 164.15(d) - Self-explanatory.

D. 33 CF 164.19 - REQUIREMENTS FOR VESSELS AT ANCHOR.

This section provides the mariner with certain requirements considered to represent prudent seamanship. The intent of this section is to require that an anchor watch be maintained to detect a dragging anchor and to monitor changes of weather or sea conditions which may hazard the vessel. The anchor watch must take the action necessary to insure the safety of the vessel. No attempt has been made to define the composition or qualifications of an anchor watch. Thus, personnel requirements are somewhat discretionary with the master or person in charge.

E. 33 CFR 164.25 - TESTS BEFORE ENTERING OR GETTING UNDERWAY.

(1) 164.25(a) - Self-explanatory.

(2) 164.25(b) - The intent of this regulation is that the alarms associated with the loss of vessel control be tested, such as "loss of electrical power to the gyrocompass" and "steering gear failure alarms" and "main propulsion machinery loss alarms." It is not intended that each and every alarm on an automated machinery installation be tested.

(3) 164.25(c) - The intent of this regulation is that there be, if needed in an emergency, a second *working* electrical power source. The test should be conducted for as long as necessary to show proper functioning, including steady-state temperature and pressure readings.

(4) 164.25(d) - Self-explanatory.

(5) 164.25(e) - This machinery need only be tested as is necessary to show that it can respond properly. For example, the backing tests could be conducted as a vessel slows to pick up a pilot if they are done outside the territorial sea. The vessel need not actually be stopped or backed down. A few indicated astern revolutions of each screw can be sufficient to verify backing capability.

F. 33 CFR 164.30 - CHARTS, PUBLICATIONS, AND EQUIPMENT: GENERAL—Self-explanatory.

G. 33 CFR 164.33 - CHARTS AND PUBLICATIONS—Self-explanatory.

H. 33 CFR 164.35 - EQUIPMENT: ALL VESSELS.

(1) 164.35(a) - A standard system will meet this requirement. One radar is all that is required. If a

vessel has two radars and one fails or is inoperable, the remaining radar still fulfills the requirement of this regulation. The reports and requirements of 164.53 are not applicable for the additional radar. Additional specifications defining an acceptable marine radar are under study by the Commandant and will be the subject of future rulemaking actions if necessary.

(2) 164.35(b) - Self-explanatory.

(3) 164.35(c) - The requirements of this regulation are discussed in 164.11(i).

(4) 164.35(d) - Self-explanatory.

(5) 164.35(e) - Self-explanatory.

(6) 164.35(f) - Self-explanatory.

(7) 164.35(g) - There are many variations of display of the required maneuvering information fact sheets. Also, many foreign vessels have information fact sheets for full and slow speed vice full and half speed. Standardized fact sheets are being developed. In the interim, fact sheets for full and either slow or half speed should be accepted. Until more specific guidelines are published, COTP's should accept reasonable attempts to comply with the requirements.

(8) 164.35(h) and (i) - The sounding and recording devices need not be separate if the recording device has a visual display. The requirement for the recording device is that it be one that can *record* continuously, not that it run continuously.

(9) 164.35(j) - No attempt has been made to define what equipment is necessary; therefore, any equipment capable of being employed in determining relative motion, including grease pencils, plotting sheets, etc., will suffice. A requirement for some sort of collision avoidance device may, in time, supersede this regulation.

I. 33 CFR 164.51 - DEVIATIONS FROM RULES: EMERGENCY.

This section permits the mariner to deviate, in *emergency* situations, from the regulations of 33 CFR Part 164 without notifying the Coast Guard. However, when failure of *critical navigation equipment* is involved, the Coast Guard must be notified as soon as possible in accordance with 33 CFR 164.53(b).

J. 33 CFR 164.53 - DEVIATION FROM RULES AND REPORTING: NON-OPERATING EQUIPMENT.

(1) 164.53(a) - Strictly speaking, a vessel which comes into non-compliance during a voyage would have to report every minor discrepancy to the Coast Guard. For practical purposes, this regulation allows a vessel to complete its current voyage and report only failures of systems critical to the safe navigation of the vessel as required by 164.53(b).

(2) 164.53(b) - This regulation requires the mariner to report to the Coast Guard improperly operating equipment which is critical to the safe navigation of the vessel. The report is to be made as soon as possible. In emergency situations (see 164.51), "as soon as possible" means as soon as it is practical to do so in view of the circumstances. In non-emergency situations (164.53(a)), "as soon as possible," means when it happens. This regulation is currently being amended to indicate that the person responsible for making the report is the master or person in charge of the vessel. The COTP or district commander to whom the report has been made, provided the officer has jurisdiction in that geographic area, must determine if separate or additional requirements should be imposed in accordance with 33 CFR Part 160 to insure the safe transit of the vessel. Subpart 80-4-1 of this manual sets forth parameters to be considered when exercising authority under 33 CFR Part 160.

K. 33 CFR 164.55 - DEVIATIONS FROM RULES: CONTINUING OPERATION OR PERIOD OF TIME.

(1) Authorized deviation. An authorized deviation for a "continuing operation" is intended as a means by which a regulation, not considered practical or necessary for safe navigation for a particular type of operation, may be waived. An example might be a vessel plying well-marked inland waterways on a continuing basis where the necessity of having an illuminated magnetic compass is questionable.

An authorized deviation for a "period of time" is intended as a means by which a temporary deferment may be granted pending drydocking, delivery of equipment, etc. For example, some existing fathometer installations cannot be retrofitted to provide the recording feature without drydocking for transducer alterations. Upon receipt of written requests, which shall include justification for deviation and expected compliance date, the COTP may authorize a deviation from the regulations. For U.S. vessels, the deviation "for time" shall be handled in accordance with subpart 30–2–10 of this manual. For foreign vessels, the master of the vessel shall be provided with a letter, with a copy to the owner, granting the deviation for a specific period and including a statement that the issuing office shall be notified in writing when the vessel is in compliance with 33 CFR Part 164. The COTP who authorizes the deviation shall make the appropriate entries in the Marine Safety Information System (MSIS).

When a vessel operates in waters within the jurisdiction of two or more COTP's, authority to deviate must be obtained from each. When an applicant applies to one COTP, that COTP shall, in turn, coordinate action on the application with the other involved COTP's. Because of the extensive latitude which these regulations provide, uniform application throughout the Coast Guard will always be a problem to some degree. What is intended by the Commandant is that COTP's use the knowledge available to them and their good judgment in the implementation of these rules to accomplish the overall purpose.

(2) Unauthorized deviation. An unauthorized deviation from these rules is a violation of U.S. regulations and should be processed in accordance with current directives.

L. 33 CFR 164.61 - MARINE CASUALTY REPORTING AND RECORD RETENTION—Self-explanatory.

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MARINE SAFETY MANUAL (CG-495)

CHAPTER 40--BOARDING OF RECREATIONAL BOATS AND UNINSPECTED VESSELS

(To be developed.)

Chapter 41--(Reserved)

MARINE SAFETY MANUAL (CG-495)

Chapter 42--(Reserved)

Chapter 43--(Reserved)

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CHAPTER 44 - POLLUTION PREVENTION

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PART 44–1—POLLUTION PREVENTION BACKGROUND AND AUTHORITY

▼44–1–1. DISCUSSION

It has taken nearly two hundred years of rapid growth and development for the general public of this nation to realize that our responsibility to protect the quality of our environment has been largely ignored. By and large, the oceans of the world have been inadvertently used by the maritime community, shoreside industries and municipalities as a general catchall for domestic and industrial wastes. Some pollution results from acts of commission and some from acts of ommission. In either case, the technology now exists to measure and combat the deterimental effects of pollution and we, as a nation, are committed to pollution prevention.

Our waterways are susceptible to unintentional pollution from many sources. Discharges into the air from land-based industrial, utility and transportation systems eventually enter the water by rainwater runoff or by direct fallout. Rainwater also carries pesticides and other pollutants from non-urban areas into the waterways. There has been a rapid increase in the bulk transportation of hazardous substances by water, including oil and petroleum-based products, and the probability of a catastrophic incident occurring which involves these cargoes, is a matter of increasing concern. On the other hand, more commonplace marine accidents also result in the pollution of the marine environment (vessel groundings, collisions, cargo transfer system failures, etc.).

Another kind of pollution is caused by untreated sewage being discharged by communities and vessels. While it is recognized that the largest contributors to water pollution of this type are the cities and towns along the waterways—industries, private citizens, and often the municipalities themselves—a significant amount does originate from vessels.

Because the ocean transport of bulk quantities of oil often involves tank cleaning and ballasting operations, unavoidable pollution occurs from these operations. Alternatives for eliminating these operational sources of pollution are being sought. Fuel tank deballasting of other vessels, not in the tanker trade, also results in "operational" pollution of the oceans.

Recognizing the deteriorating state of our waterways, Congress has enacted legislation to restrict the discharge of pollutants and penalize violators. Among these laws are the: Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 *et seq.*); Ports and Waterways Safety Act of 1972 (33 U.S.C. 1221 *et seq.*); Marine Protection Research and Santuaries Act (33 U.S.C. 1401 *et seq.*); Oil Pollution Act (33 U.S.C. 1001 *et seq.*); and the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*). (See part 2–4 for a further explanation of the various acts.)

The principal statute for controlling marine pollution is the Federal Water Pollution Control Act (FWPCA). This statute provides for the prevention of marine pollution by oil, hazardous substances and sewage from vessels. It further provides for early detection or notification of discharges, enforcement in cases of contravention, response and cleanup activities (should a discharge occur), and the regulation of marine sanitation devices to comply with standards set by the Environmental Protection Agency (EPA). It is the prevention aspect provided by the FWPCA that is presented in this chapter.

Prevention includes the regulation of commodity-handling operations. It also includes the design and construction of vessels and onshore and offshore facilities to minimize the occurrence of harmful discharges. To this end, the Federal responsibility for pollution prevention is divided between the U.S. Coast Guard and the EPA. The EPA is responsible for all facilities, both onshore and within the territorial sea (within three miles), that are not transportation-related. Included in the definition of "non-transportation-related" facilities are those facilities that drill, produce, gather, store, process, refine, transfer, distribute or consume oil and hazardous substances. EPA has certain "non-transportation-related" facilities located on or adjacent to the navigable waters of the United States. (See 40 CFR part 112.)

The Coast Guard, under the authority of 33 U.S.C. 1321(j)(1), published regulations which provide for equipment requirements and operating procedures and training of personnel from vessels and "marine-transportation-related" facilities.

PART 44-2 -- OIL POLLUTION PREVENTION REGULATIONS

44-2-1. GENERAL

Regulations for the prevention of water pollution are required by section 311(j)(1)(C) and (D) of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1321 et seq). Revised regulations, 33 CFR 154-156, became effective on 3 March 1980.

The regulations were revised because frequent operations (such as cargo tank cleaning, bilge pumping, and ballasting), equipment failure, and personnel errors pose much more risk of oil spills than the infrequent catastrophes which gain immediate publicity. These operational-type spills can be prevented by maintenance and testing of equipment, personnel awareness, and proper procedural requirements. Coast Guard experience in enforcing the provisions of the FWPCA and the original regulations, as well as public and industry comments, have been taken into account in this revision.

The intent of the regulations is to prevent pollution through compliance with "good marine practice" as well as "the letter of the law." If violations are detected during routine inspections, correction is the initial action to be taken; this shall be followed by a Report of Violation and formal penalty action if appropriate (see Chapter 13, Volume I of this manual).

44-2-5. 33 CFR 154 - MARINE OIL TRANSFER FACILITIES

44-2-5A. §154.100 - APPLICABILITY

The regulations are aimed at preventing discharges which threaten substantial pollution of the navigable waters of the U.S. by oil. Marinas normally do not transfer oil in quantities that justify stringent pollution regulations. Also, Coast Guard personnel are not available to monitor all small-quantity oil transfer operations. Marinas, however, are subject to Part 154 when transfers to or from vessels with capacities of 250 barrels (bbl) or more of oil are conducted. A genuine risk of oil pollution is posed by vessels with capacities exceeding 250 bbl (10,500 gallons) of oil, even when 250 bbl or less are actually being transferred. Part 154 applies to onshore facilities as defined in Section 311(a)(10), FWPCA, and presently only to those offshore facilities within the navigable waters of the United States.

Facilities in locations outside the navigable waters of the U.S. were made subject to Section 311 of the FWPCA by a change to the definition of an offshore facility in 1977. A proposal to extend the applicability of the regulations to facilities on the Outer Continental Shelf is under study, and development of a memorandum of understanding (MOU) with the Environmental Protection Agency (EPA) and the U.S. Geological Survey (USGS) is pending.

44-2-5A(1). Federally-owned and Operated Facilities. All facilities must comply with the requirements of 33 CFR 154 and 156. Primary responsibility for enforcing these regulations at Federally-owned and operated facilities is not vested in the Coast Guard, and resides with the Federal agency owning and operating the facility. However, it would be inconsistent with the Coast Guard's general enforcement responsibility and not in the public interest to ignore violations occurring at such facilities. Therefore, with regard to Federally-owned and operated facilities, the Coast Guard shall:

- Support and assist the efforts of the Federal agency involved to comply with the pollution prevention regulations;

- Conduct inspections and monitor transfer operations at such facilities, and enter such facilities to gain access to commercial vessels berthed there, only when approval is granted by the cognizant Federal agency;

- Advise other agencies of violations, when observed or reported, and of requirements which must be met to achieve compliance.

When a violation is observed at a Federally-owned and operated facility, the COTP shall:

(1) Advise the agency's responsible official of the violation(s) found via official correspondence;

(2) Explore all possible means of resolving the matter and achieving compliance; and

(3) Submit relevant documentation to the district commander for disposition if compliance is not forthcoming.

Upon receipt of documentation from the COTP indicating violations at such facilities, the district commander shall explore all possible means of reaching a mutual agreement for achieving compliance. Such efforts will be undertaken with the cognizant agency's equivalent in the chain of command (e.g., regional administrator, district commandant, district engineer, etc.). All such efforts should be fully documented. If this procedure fails to achieve a resolution of the situation, Commandant (G-W) shall be forwarded all relevant information for resolution with the parent agency.

44-2-5A(2). Federally-owned, Privately Operated Facilities. Routine enforcement policy and procedures apply to violations at such facilities.

44-2-5B. §154.105 - DEFINITIONS .

The definition of "transfer", added to all three parts for clarity as it is mentioned throughout, clarifies the applicability of the regulations to transfers of oil within vessels.

The definition of "oil" in section 311(a)(1), FWPCA applies to these regulations. "Oil" does not include liquefied natural and propane gases, nor does it include any substance designated by EPA as a hazardous substance in 40 CFR 116. "Oil" does include animal and vegetable oils, and these regulations apply to bulk transfers of any kind of oil to or from a vessel with a capacity of 250 bbl or more of oil (see plate 13-2-5C.1, Volume I of this manual).

44-2-5C. §154.107 - ALTERNATIVES

This subpart was reworded so that the COTP may consider both economic and physical conditions when reviewing a proposed alternative. The regulations may not be circumvented without good reason even where alternative protection is afforded.

EPA has suggested that alternative requests document the equivalency of environmental protection and allow the Coast Guard to require other information, such as economic and environmental assessments. Documentation of alternatives is required and includes documentation of safety and pollution protection; the COTP may request additional information, if necessary, to evaluate the proposed alternative. A request will necessarily include an economic and environmental analysis; however, as an equivalent level of protection is required, no formal environmental impact statement is necessary.

As waivers from compliance are now distinguished between alternatives (granted by the COTP) and exemptions (granted only by the Commandant), all COTP's shall review existing waivers which were granted under the initial regulations, to determine which are qualified to continue as alternatives and which must be submitted to Commandant (G-W) for approval as exemptions.

Most requests for deviations from the regulations should be processed as alternatives. COTP's and district commanders should not treat a request that provides an alternative means of compliance as an exemption request simply because numerous facilities scattered throughout several COTP zones are involved.

Alternative procedures, when approved by the COTP, should be described in the operations manual as well as the facility file at the COTP.

44-2-5D. §154.108 - EXEMPTIONS

Where appropriate, exemption requests forwarded to Commandant (G-W) shall include observations or assessments of the situation from the COTP to assist in making an equitable decision on whether or not to grant an exemption. Exemption requests shall be forwarded to the Commandant only when all means of alternative compliance have been exhausted. The exemption process is not intended to provide relief for companies with numerous facilities when compliance through alternative means is possible.

44-2-5E. §154.120 - FACILITY EXAMINATIONS

Normally, these examinations for compliance with part 154 and part 156 are conducted during daylight working hours. However, the COTP shall be able to

conduct examinations whenever the facility is operational, as deemed necessary.

Facility inspections shall proceed inland from the dock area as far as necessary to identify the "oil transfer system," including the piping arrangement used to transfer oil to or from the storage or processing operations.

44-2-5F. §154.300 - OPERATIONS MANUAL; GENERAL

Each facility is expected to have an operations manual of such sufficiency that a person generally qualified in oil transfer operations can perform the function in an environmentally safe manner. These are intended to be working manuals for the benefit of personnel involved in oil transfer operations and must be understood, as a minimum, by all of those designated as persons-in-charge. The operations manual should be the single source for learning standard operations as well as emergency procedures at a facility. Small, simple facilities should have simple manuals, while large, multiproduct facilities should have more comprehensive manuals.

The requirement to send a copy of the operations manual with the letter of intent has been included because the COTP should know that the owner/operator has established procedures which permit the facility to be operated in an environmentally sound manner.

44-2-5G. §154.310 - OPERATIONS MANUAL; CONTENTS

Personnel should know the location of all safety equipment required at the facility. Section 154.545(c) provides that time limits for gaining access to oil spill containment materials shall be set by the owner/operators of the facilities themselves, subject to approval by the COTP. This is necessary to ensure that equipment-sharing agreements among facility owner/operators are realistic and can provide adequate response to oil discharges.

Cargo information is the responsibility of the vessel operator. Cargo data must be readily available to facility personnel for safety and environmental reasons.

Putting names and telephone numbers on a separate sheet for easy amendment is a good idea, and the regulations permit the operations manual to be in looseleaf form for this purpose. Additional considerations for evaluating time limits set by the operator are discussed in section 44-2-5N.

44-2-5H. §154.325 - OPERATIONS MANUAL; LETTER OF ADEQUACY

COTP's are allowed three years to review facility operations manuals for the facilities in their zones. New facilities and those making substantial changes to their existing manuals must follow the procedure set forth in 33 CFR 154.320(b). A letter of adequacy ensures that certain matters are addressed in the operations manual, but does not constitute Coast Guard approval or certification of any particular procedure or equipment mentioned. Such a letter addresses the scope of the manual's contents rather than its details. The intent of the three-year time limit is to ease the administrative burden upon the COTP.

44-2-5I. §154.500 - HOSE ASSEMBLIES

This section requires that the burst pressure and the pressure used for the test required by section 156.170 not be marked on the hose, to prevent confusion with the maximum allowable working pressure (MAWP). Pressures other than MAWP which are marked on hoses presently in use may be obliterated by any suitable means until replaced by hose with proper markings. There is no need to test back-pressure nozzles since they are reliable for the small hoses with which they are used. They are not intended for large hose, which is not used with flush-deck fittings.

If a facility has older hose in storage that does not meet all of the requirements, an alternative may be requested for unused, pre-1973 hose under §154.107.

44-2-5J. §154.510 - LOADING ARMS

The intent of this section is to have a uniform and safe standard not subject to undue modification; an alternative under §154.107 may be requested for locally constructed arms. Only loading arms placed into service (installed) after 30 June 1973 are regulated, to avoid expensive retrofitting at facilities. Manufacturers of loading arms should be consulted in questionable cases.

44-2-5K. §154.525 - MONITORING DEVICES

The primary purpose of this section is to provide monitoring systems for the detection of spilled oil, to ensure adequate and rapid clean-up efforts. This requirement is intended only for those cases in which visual surveillance is insufficient to detect oil spills in very sensitive areas, or where a complex operation would likely result in a large spill without the presence of a monitoring device. In such cases, use of the oil monitor should significantly increase the probability of detection or significantly aid in limiting the spread of spilled oil through early detection. It would be an unreasonable economic burden to require monitoring devices at all transfer facilities.

44-2-5L. §154.530 - SMALL DISCHARGE CONTAINMENT

The intent of this section is not to require containment over the water. Blanking of hose until connected and use of hose complying with § 154.500 should prevent most spills over the water. The containment is intended to contain small leaks at connecting points until emergency shutdown or proper removal is possible.

44-2-5M. §154.540 - DISCHARGE REMOVAL

The optimum arrangement is for a fixed drain system to remove discharges and normal precipitation from the facility. In general, the system should be either mechanically or gravity operated. The phrase "safely and quickly" is relative and must be considered in relation to the products involved. One effect this section should have is to keep large surface areas of highly volatile products (e.g., gasoline) from forming and also provide a means to drain precipitation or other liquid from the containment so as to keep the full required capacity available during the transfer. In the case of a portable containment system, the potential weight when full must be considered and provisions must be made for emptying it. A system is unacceptable if the most likely action by the owner/operator is to drain the container into the water.

44-2-5N. §154.545 - DISCHARGE CONTAINMENT EQUIPMENT

Only unusual situations require pre-transfer booming, and there should be no great variance among COTP's in interpreting the regulation. There is no intent for pre-transfer booming to be a common practice. The authority to require containment to be deployed before the transfer is specifically mentioned because in some cases it is the only practical way to protect the environment from particularly risky transfer operations.

The operator shall take currents into account when establishing time limits for deploying booms in the event of a spill. While booms may not contain oil when deployed in rapid currents, they may be effective in directing the movement of the oil and in protecting some areas from environmental damage.

Each facility must have discharge containment equipment available, whether by direct ownership, membership in a cooperative, or by pre-arrangement with commercial interests. Shared or commercial equipment must be located so as to be brought on-scene in a timely manner. The determination of location and timeliness should reflect local conditions; in current or tidal areas, the time to deploy would probably be less than that required for still water areas. In current or tidal locations with ecologically sensitive adjoining areas, booms set in place during each transfer operation may be appropriate.

A facility should be prepared to contain and remove the contained discharge in accordance with these regulations, the National Contingency Plan, and 33 CFR 153.

44-2-5O. §154.550 - EMERGENCY SHUTDOWN

This section applies specifically to the transfer of oil from the facility to the vessel.

As it is intended that the person-in-charge of the vessel be able to immediately stop the loading operation in the event of hose failure or overfill, the emergency means to stop the transfer should normally be located on board the vessel.

Among other factors to be considered by the COTP in authorizing one person-in-charge to act for both the vessel and the facility (§156.115) is accessibility of the emergency means to shut down the transfer.

In the event that the person-in-charge of the vessel does not remain in the proximity of "his or her usual operating station" where the emergency shutdown controls are located, acceptable alternative measures must be provided to maintain the emergency shutdown capability. The dedicated system may be the same as the one required in §154.560 if positive, continuous communications are provided. An audible alarm system will not satisfy the requirement of "continuous dedicated communications."

The flow closure devices actuated by the emergency shutdown system must be physically located on the facility side of the hose. If the device may cause hydraulic shock to the system, the system must be capable of withstanding such shock loading.

Proper closure sequencing of pumps and valves may be necessary (e.g., that the pumps be stopped prior to closing the pipeline to prevent rupture) and is certainly not precluded in the regulation, provided the applicable time limit in paragraph (c) is met.

44-2-5P. §154.560 - COMMUNICATIONS

Adequate communications between the vessel and the facility are essential to coordinate control of the transfer operation. Two-way voice communications enable each person-in-charge to hear the other and, in the event that these persons are not close enough to be readily heard by voice alone, the facility shall provide an effective means of communications. For single person-in-charge operations or facilities with a low ambient noise level, an electronic or sound-powered system may not be necessary. Consideration must be given, however, to the probable location of personnel during various stages of transfer operations and in inclement weather, to ensure that two-way communications are possible.

Intrinsically safe equipment is required only in hazardous locations on vessels carrying flammable liquid cargoes or combustible liquid cargoes with a flashpoint below 60°C (140°F). Suitable radio devices used to comply with this section of the regulations must be approved as intrinsically safe by either Underwriters' Laboratories, Inc. or Factory Mutual Research Corp. Intrinsically safe radios are not required on vessels certificated to carry and carrying only Grade E liquid cargo.

44-2-5Q. §154.570 - LIGHTING

Adequate lighting is a prerequisite for any nighttime operation, and objective standards are needed where the COTP is in doubt as to the adequacy of lighting. Only when lighting appears inadequate to the COTP (a flashlight should not be necessary for effective operations) is specific testing necessary. At small remote facilities where portable lights are used or illumination is provided by a tug, the shielding of lighting shall be specified in the operations manual and in the written directions for oil transfer operations.

44-2-10. 33 CFR 155 - VESSELS

44-2-10A. §155.100 - APPLICABILITY

The definition of "vessel" in subsection 311(a)(3), FWPCA applies to all vessels, foreign- and U.S.-flag, in the navigable waters or the contiguous zone of the United States. A proposal to extend the applicability of the regulations beyond the contiguous zone in accordance with the 1977 amendments to the FWPCA is under development.

U.S. vessels must meet the applicable requirements of 33 CFR 155 to be eligible for issuance of a Certificate of Inspection under the applicable subchapters of Title 46, CFR. Government-owned vessels, if engaged in commerce, must also comply with these regulations. Public vessels which would otherwise be exempt from compliance must meet the requirements of 33 CFR 155 if they are to be certificated by the Coast Guard. Consequently, a vessel's COI will be accepted as evidence that the vessel is in compliance with 33 CFR 155.

Tank barges which are inspected under 46 CFR Part 30-40 (Subchapter D - Tank Vessels) and 46 CFR Part 150-154 (Subchapter O - Certain Bulk Dangerous Cargoes) for the carriage of flammable or combustible cargoes which are not considered "oil" need not meet the requirements of 33 CFR 155. In such cases, the Certificate of Inspection should be endorsed "33 CFR 155 need not be complied with unless oil is carried."

For the purpose of these regulations, a vessel which is permanently moored at a fixed location so as to be "substantially a land structure" may be considered an integral part of the facility, without regard to its current use as a pumping facility, temporary storage facility, or work platform. So as to be held not subject to the provisions of 46 U.S.C. 391a, the vessel must be so securely and substantially moored by means such as cables, chains, structural steels, etc. to a solid onshore anchorage or other captive structure that it is considered substantially a land structure (see section 30-10-25A and subpart 30-10-50).

Floating vessels used as facilities which have on board flammable or combustible liquid cargo in bulk, for any purpose other than as specified below, will continue to be inspected as tank vessels, unless they meet the provisions of the preceding paragraph. The inspection provisions do not apply to floating vessels which have on board flammable or combustible liquids within a containment system installed for the sole purpose of compliance with §154.530, when this accumulated liquid would routinely be discharged to the shoreside portion of the facility. Although floating non-tank vessels with a containment system only will not be subject to inspection under 46 U.S.C. 391a, all onboard portions of the containment system such as piping, collection and holding tanks, vents, pumps, etc. shall be examined for safety and satisfactory operation as part of the facility examination referred to in §154.120.

44-2-10B. §155.110 - EXEMPTIONS

Where appropriate, exemption requests forwarded to Commandant (G-W) shall include observations or assessments of the situation from the COTP to assist in making an equitable decision on whether or not to grant an exemption. Exemption requests shall be forwarded to the Commandant only when all means of alternative compliance have been exhausted. The exemption process is not intended to provide relief for vessels which traverse many COTP/OCMI zones when compliance through alternative means is possible.

44-2-10C. §155.310 - CARGO DISCHARGE CONTAINMENT

The language in this section was changed to clarify the requirements for hoses and loading arms, and to require that the specified capacity exist in all conditions of vessel list or trim during the transfer operation. If a tank barge uses a coaming instead of complying with paragraph (a), it must still be able to keep spilled oil within the coaming and portable containers until properly drained or removed, without discharging oil into the water.

Mechanical means of closing drains that are acceptable are valves, threaded caps, or threaded plugs which eliminate the need for placing rags, concrete, plastic or wooden plugs, or other devices in or over drains in the fixed containment system. The procedures presently required by 46 CFR 35.35-10 for plugging general deck scuppers remain valid.

Barges are allowed an option which other tank vessels do not have, due to deck construction which often makes large fixed containment impractical or unsafe. Generally, however, coamings installed around the periphery of a vessel should not be allowed in lieu of containment. The safety problems in utilizing a large expanse of deck as a containment area preclude acceptance of the total deck enclosure alternative. Conditions of list or trim, rain accumulation, method of product removal, fire hazard, structural considerations, and personnel safety are factors which render such peripheral coamings undesirable.

With respect to drains, the installation should be compatible with existing regulations which require a check valve in the drain line if flammable liquids are carried, and the line connects directly to a cargo tank. Drains need not be piped to cargo tanks. Alternative means of draining the containment must not create a potential source of discharge.

A drainage system will not be accepted where the most likely result is the draining of oil into the water or the bilges of auxiliary spaces or the mixing of incompatible products. Use of collection tanks is encouraged. Pumping of contained oil into portable drums or containers is discouraged.

Arrangements between vessels and facilities for removal of oil spilled into containment systems shall be resolved in a timely manner by both parties.

44-2-10D. §155.320 - FUEL OIL AND BULK LUBRICATING OIL DISCHARGE CONTAINMENT

Although this section applies to all vessels of 100 or more gross tons, the primary division was made by construction dates and gross tonnage. For the purpose of applying these regulations, date of construction means the date on which the keel is laid or active construction of the vessel is begun.

When lube oil is carried as cargo, the vessel must comply with §155.310 for containment. §155.320 has been revised to require containment when lube oil is transferred and carried in bulk as stores for consumption by the vessel.

This section generally applies to the area immediately surrounding the fueling station and associated vents. This regulation does not apply to:

- The vent header system;

- "Flush deck fittings," even though raised slightly off the deck to prevent the entry of water; and

- Vents for small independent auxiliary fuel tanks, such as used on barges for pumpdrive engines, when the tank is designed to be filled with a back flow shut-off nozzle or similar arrangement.

This regulation applies to fuel tank vents fitted with goosenecks as opposed to straight-type vents which are common on foreign vessels. Most straight-type vents will discharge oil in a 360-degree horizontal pattern, which rules out the use of portable containers. Using the bulwarks to keep the oil on the vessel and then relying on coamings or plugged scuppers to contain the discharge is not acceptable. For the most part, straight vents will require fixed containment around the vent head or modification of the vent itself.

Unusual or complex piping arrangements on existing vessels need not be retrofitted if it can be demonstrated that, in the operation of fueling the vessel, an equivalent level of protection will be provided (see 33 CFR 155.107). For example: regulations imply the use of external containers; however, devices built into a vent line or a system to contain the required amount of oil, while still permitting the vent to function, will satisfy these requirements (for safety reasons, such devices must be made obvious to gas-chemists and must be capable of gas-freeing). Vent header systems which lead to a final tank that constitutes the containment are also acceptable. Alternative procedures, methods, or equipment standards shall be clearly explained in the oil transfer procedures for the vessel.

44-2-10E. §155.330 - OILY WASTE AND SLOP RETENTION

Most vessels will have a waste or slop oil tank. All vessels must have the ability to retain oily waste and oily bilge slops on board. Use of the bilge itself is acceptable on vessels which have essentially dry bilges and which collect only very small quantities of machinery oil drippings. Vessels with wet bilges which are essentially oil-free need not provide a special tank for bilge water disposal. Such arrangements in no way constitute an exemption from assessment of a penalty for discharging a harmful quantity of oil.

Proposals to pump the oily wastes and oily bilge slops to fuel tanks or ashore through the bunkering lines have been received. These proposals have been accepted when the systems have incorporated proper safeguards. The acceptance of these proposals has raised questions regarding the applicability of 46 CFR 56.50-50(h). This paragraph will be clarified by specifically permitting the discharge of oily wastes and oily bilge slops to fuel tanks and ashore through bunkering lines. The system must be arranged to preclude the discharge of fuel into the bilge system. Normally, double check valves (one a stop check valve) will be required between the bilge pump discharge and the bunkering line or fuel tank. The discharge to the fuel tank must enter the top of the tank, if possible.

44-2-10F. §155.340 - BILGE SLOPS ON VESSELS OF 100 OR MORE G.T. - OCEAN OR COASTWISE SERVICE

Uninspected U.S. vessels from 100 to 300 G.T. are exempt from the provisions of 33 CFR 155.340. The regulations in 33 CFR 155.350 are entitled "Bilge slops on vessels of 100 or more gross tons: Operations other than ocean or coastwise service." It would appear that uninspected U.S. vessels from 100-300 G.T. in ocean or coastwise service are not covered by these two sections of the regulations; this is not the case. 33 CFR 155.350 states that "No person may operate a vessel of 100 or more gross tons that is fitted with either main or auxiliary machinery spaces and is not subject to 155.340, unless . . . ." This makes 33 CFR 155.350 applicable to all U.S. vessels above 100 G.T. not covered by §155.340 regardless of the title of the respective sections. A future change to the regulations will clarify these sections.

The requirement for a means on the weather deck near the discharge outlet to stop the pump required by 33 CFR 155.340 or 155.350 may be satisfied by a suitably installed pressure switch to stop the pump when the stop valve required by this section is closed.

44-2-10G. §155.360 - BILGE SLOPS ON VESSELS OF LESS THAN 100 G.T.

These vessels must have a fixed or portable means to discharge oily bilge slops to a reception facility. Equipment which may be acceptable for recreational vessels may not be satisfactory for vessels which, because of their size and more frequent or severe service, will have a greater quantity of bilge slops to discharge. The minimum requirements for some of the larger vessels can only be established after local examination.

44-2-10H. §155.400 - EXEMPTION FOR OILY WASTE PROCESSING EQUIPMENT

This section provides that a vessel may be exempted from the applicable requirement for a piping system capable of discharging oily wastes to a reception facility. To gain this exemption, there must be installed on the vessel an oily waste processing system that is acceptable to the Commandant. Systems that are acceptable include a 15ppm discharge system with components that meet applicable Coast Guard specifications (46 CFR 162.050) or IMCO standards (Resolution A 393 (X)), or process (such as by incineration) all oily wastes so that there is no accumulation of such wastes to be discharged either at sea or to a reception facility.

44-2-10I. §155.440 - PLACARD

The placard shall be posted, as specified, in any machinery space which will generate or collect oily waste such as gear oil or crankcase oil (e.g., auxiliary spaces on unmanned barges). Pleasure boats 26 feet or more in length must also comply with this provision.

44-2-10J. §155.470 - PROHIBITED OIL SPACES

This section applies to all self-propelled vessels. Where collision bulkheads are not fitted, the requirement applies to the forwardmost continuous bulkhead.

44-2-10K. §155.700 - DESIGNATION OF PERSON-IN-CHARGE

The operator or his agent must designate in advance those individuals who may serve as person-in-charge. There should be a current list of such designated individuals available. The person who signs the Declaration of Inspection (DOI) described in §156.150 is the person-in-charge until his relief signs the DOI.

44-2-10L. §155.720 - OIL TRANSFER PROCEDURES

The intent of this section is that written directions for oil transfer operations must be on board whenever the vessel is in service, though their use is required only during transfer operations. Paragraph (b) was added because a number of Coast Guard districts have documented spills from fuel day tank transfers, cargo tank transfers, and other internal vessel transfers. The Pollution Incident Reporting System (PIRS) has documented approximately 140 spills per year from internal vessel transfers from 1973-77. These written procedures for internal vessel oil transfers need not be so complex as for cargo or fuel oil transfers to a facility or another vessel, but they should be available and referred to before and during internal transfers.

Section 155.740(b) allows posted procedures. Directions for oil transfer operations with the contents required by §155.750 can be written simply enough to be posted; no separate manual is necessarily required.

Directions for oil transfer procedures are not intended to be training manuals for tankermen, but they must explain any abnormal or complicated instructions so that the transfer system may be operated safely and in a pollution-free manner. On an unmanned tank barge, for example, a simple line drawing of the piping arrangement showing any unique features, properly labelled, may suffice. Emergency phone numbers shall also be entered in these procedures.

44-2-10M. §155.740 - AVAILABILITY OF OIL TRANSFER PROCEDURES

The intent of this section is that primary vessel personnel involved in oil transfers know the procedures regardless of language differences. Vessel owners and operators may decide what crews to hire, but whoever is transferring oil must know how to perform with minimal risk of pollution. Transfer procedures need not be posted on unmanned tank barges; however, they must be readily available to transfer personnel. On tank vessels, the transfer procedures must be kept in a place on the vessel accessible to those members of the crew who engage in oil transfer operations. Detailed data and procedures need not be permanently posted, but their location should be easily determinable.

44-2-10N. §155.750 - CONTENTS OF OIL TRANSFER PROCEDURES

The regulation requires rather detailed information for the oil products transferred to or from a vessel. The intent is to ensure that the prevention regulations are applied to all oil products transferred in bulk.

Tank barges have had difficulty keeping oil cargo information on board due to space limitations and because Section 155.750(a)(1) has been strictly interpreted to require carriage of a separate cargo information card for each cargo for which the barge is certificated. Since the intent of this section is to provide the tankerman or person-in-charge with information on the hazards and correct handling of the products with which he is dealing, only information cards on oil cargo actually on board should be required. Any requirement in excess of this adds nothing to pollution prevention and causes confusion. Oil cargos with similar characteristics can be listed together on one information card for convenience; however, those oil cargos with significantly different characteristics such as different grades should be listed separately.

COTP's are encouraged to point out the essential cargo information desired, such as special hazards if different from oil generally and procedures for oil spills; allow summary data where feasible; and allow revision of the procedures using the amendment procedures in §155.760 when legitimate problems arise in existing procedures.

44-2-10O. §155.780 - EMERGENCY SHUTDOWN

This section specifically addresses the transfer of oil from the vessel to a facility or to other vessels. Installation of additional remote shutdown stations may be necessary, depending upon the movements of the person-in-charge during the oil transfer. In lieu thereof, consideration may be given the use of appropriate portable radio communications between the person-in-charge and the crew member located at the remote shutdown station.

44-2-10P. §155.785 - COMMUNICATIONS

This regulation requires continuous communications to ensure that rapid shutdown of the transfer is possible. Voice communications may not be sufficient due to ambient noise levels in the area or distance between persons-in-charge (see section 44-2-15D).

44-2-10Q. §155.790 - DECK LIGHTING

The vessel is responsible for providing adequate illumination consistent with §154.570 to ensure a pollution-free operation. The adequacy of existing vessel cargo deck lighting will normally be determined by practical demonstration. Verification by instrument may be required in questionable instances.

44-2-10R. §155.810 - TANK VESSEL SECURITY

Notwithstanding 46 CFR 35.05-15(b) (which is about to be amended), moored tank barges shall be kept under surveillance when they are not gas-free. COTP's must assess each situation to ensure that local procedures satisfy the requirement for vessel security with due regard for the particulars of the mooring facility, location of personnel acting as watchmen, environmental considerations, and other factors which affect the situation.

44-2-10S. §155.815 - TANK VESSEL INTEGRITY

The listed openings must be tightly shut, except as allowed by paragraph (b), to prevent the entry of water or loss of oil. When tank vessels have oil cargo or oil residue onboard while in navigable waters of the U.S. or the contiguous zone, they must comply with the provisions of this section. Tank vessels that are gas-free are clearly not covered by this section.

44-2-10T. §155.820 - RECORDS

Records which must be maintained and be "available for inspection by the COTP or OCMI" shall be readily available to Coast Guard personnel (in the case of unmanned tank barges, this information would generally be kept with the Certificate of Inspection). The licensed officer or certificated tankerman hired by the owner/operator to conduct the oil transfer operation in each local area shall be listed as required by §155.700. In the case of a tankering service company, such company must be designated an agent by the vessel owner/operator.

44-2-15. OIL TRANSFER OPERATIONS INVOLVING VESSELS - 33 CFR 156

44-2-15A. §156.100 - APPLICABILITY

Government-owned vessels engaged in commerce are subject to the requirements of 46 CFR 156. Other public vessels are usually required by internal guidelines to meet or exceed these standards. All other vessels with a capacity of 250 bbl of oil are regulated for transfers to, or from, or within them (including internal fuel and lube oil transfers, which have been the source of numerous spills in the past).

44-2-15B. §156.112 - SUSPENSION ORDER

The intent of this section is to allow for issuance of rapid suspension orders for serious conditions which threaten an imminent discharge of oil; the rule also allows suspension if Coast Guard personnel are not permitted to inspect the operation to ensure compliance with the regulations. The COTP/OCMI shall immediately be advised of any action suspending an oil transfer operation, and in most cases is consulted prior to any suspension order. In any event, the operator is free to immediately contact the COTP/OCMI to question the suspension order or to advise of corrective action to have the order lifted.

44-2-15C. §156.115 - PERSON-IN-CHARGE - LIMITATIONS

Generally, the facility and each vessel should have a person-in-charge of an oil transfer operation, unless the cognizant COTP determines there is no increased risk of pollution from one person-in-charge supervising more than one vessel.

When assessing whether to grant a request to allow supervision of more than one transfer at a time by a person-in-charge the COTP should consider at least the following:

- At the particular facility in question, and under specified or controlled conditions, can one person effectively perform all the operations?

- How complex is the operation and what degree of mechanization is provided to assist the operator?

- Can the person in charge operate the emergency shutdown for each transfer and respond to spills adequately?

- The past performance of the facility, where pertinent.

For example, mooring two adjacent barges manifold-to-manifold may be acceptable for single-person transfer operations; while mooring those barges end-to-end, placing the manifolds a considerable distance apart, may be unacceptable (see the discussion in §154.550).

Such requests should not be referred to Commandant (G-W) as an exemption request under §156.110.

44-2-15D. §156.120 - REQUIREMENTS FOR OIL TRANSFER OPERATIONS

Vessel and facility owner/operators are responsible for the actions or inactions of their employees, and have the responsibility to train personnel and ensure their compliance with safety and environmental standards. Because personnel error is a predominant cause of oil spills, training and personnel compliance are essential to any pollution prevention program.

If the person-in-charge of a vessel or facility is not satisfied with the intended operation at the pre-transfer conference, the transfer shall not proceed until such time as the process is clearly understood and accepted.

In making crew changes or in changing the watch during cargo transfer operations, the oncoming member of the crew should ensure that all the provisions of the DOI are being met. When he signs the form he becomes the person-in-charge.

The intent of paragraph (a) is to ensure that mooring lines are regularly checked throughout the transfer operation to prevent the parting of or strain upon hoses which could lead to an oil spill.

Paragraph (g) supersedes the provisions of 46 CFR 35.35-20(d) allowing loading of Grade D and E cargoes through an open hatch. Due to the fire hazard (static electricity combustion) produced from free-falling grade D and E cargoes, and the health hazard from fumes posed to personnel in the cargo hold above the "deep tank", the proposed exemption which allowed loose hose transfers over the top has been deleted from paragraph (g).

The term "fixed connection" should be interpreted to mean the fixed cargo piping system installed on the vessel. In cases where the fixed cargo piping system does not exist, or where it is impossible or undesirable to use this system, the COTP should consider granting an alternative under 33 CFR 156.107 to allow use of a "portable transfer system." This system should consist of the following:

- Hose which meets the requirements of 33 CFR 154.500 or portable piping which meets the requirements of 46 CFR 56;

- Connections which meet the requirements of 33 CFR 156.130;

- A closure, such as a manhole cover, butterworth plate, flange, or deepwell pump stack, which forms a vapor-tight seal over the opening in the tank top through which the cargo is transferred. This closure should be bolted or dogged in place, and the hose and drop line should be connected to it.

- A metallic drop line which meets the requirements of 46 CFR 153.282 (not necessary when transferring grade "E" edible vegetable or animal oils);

- A drip pan of at least 1/2 barrel capacity under each connection on the weather deck or ashore;

- A shutoff valve at or near the point of entry into the tank;

This alternative of a portable transfer system should be restricted to transfers of grades "D" and "E" cargos; however, approval has previously been given by Commandant (G-MHM) to certain parcel chemical tankers for the transfer of cargo using this method. Continued acceptance should be considered for these vessels.

Paragraph (h) prohibits simultaneous cargo transfer and ballasting or deballasting of cargo tanks, except for specific circumstances set forth in 33 CFR 157, which is consistent with the 1978 Protocol to MARPOL 73. These circumstances are:

- Ballasting or deballasting of segregated ballast tanks (SBT's) because the pump and piping system are separate from the cargo system;

- Ballasting or deballasting of dedicated clean ballast tanks (CBT's) either in accordance with 33 CFR 157, or where an independent ballast system for CBT's is installed;

- Simultaneous ballasting and cargo discharge in accordance with 33 CFR 157, to prevent hydrocarbon vapor emissions on a tank vessel with a crude oil washing (COW) system. The intent is to prevent accidental mixing of ballast water and cargo oil or loss of oily mixtures to the water.

"Reinforcement" is defined in paragraph (j) of the regulation. If the first fabric layer (the "breaker" layer) is loosely woven and primarily intended to aid in bonding the cover to the rest of the hose, it is not considered a reinforcement layer. Hose repairs are allowed, provided that the reinforcement is not penetrated, there are no leaks, and the repaired hose meets the testing requirements in §156.170.

Paragraph (r) is meant to ensure the equipment is operable. Triggering the device is not always necessary to achieve compliance.

Paragraph (t)(1) has been modified to make it clear that the person-in-charge must be able to supervise all oil transfer personnel during transfer operations. "At the site" means that the transfer point is in view, and that the person-in-charge is in a position to supervise the overall transfer operation and respond to emergencies immediately. The requirements in paragraph (t) and (u) are not redundant; paragraph (t) applies to the person-in-charge, while paragraph (u) requires all personnel to be on duty and to comply with transfer guidelines. However, if a person-in-charge is the only person involved, that person must comply with both (t) and (u).

Paragraph (v) does not require that the persons-in-charge speak English, but it requires that such persons be able to speak to each other or that an interpreter be continually present (this assumes that each in turn can communicate with subordinates).

In making crew changes or in changing the watch during cargo transfer operations, the on-coming members of the crew shall ensure that all provisions of the DOI are being met. By signing the form, the oncoming person-in-charge assumes responsibility for the progress of the transfer operations.

44-2-15E. §156.125 - OIL DISCHARGE CLEANUP

The intent of this section is to control the spread of oil as well as to stop the source before resuming transfer operations. COTP authorization is required for resumption of normal transfer operations, not for the removal of discharged oil from the water and its return to proper storage. As long as removal by the spiller is performed properly, the COTP (as the on-scene coordinator for Federal response activities) will not interfere in the spiller's cleanup operations.

There should, of course, be no spills or leaks in the work area during transfer operations. A leak into containment devices is not treated as a discharge into the water, and if the leak can be stopped without halting the transfer, that may be sufficient. However, the specified containment capacity must be available throughout the transfer operation.

DOI requirements of 46 CFR 35.35-30 will be revised to ensure compatibility between them and the DOI requirements of this section. The ship/shore safety checklist from the International Oil Tanker and Terminal Safety Guide, sufficiently expanded to include the requirements of these regulations, is acceptable.

§156.150(f) requires operators of vessels and facilities to keep a copy of the DOI for one month. When vessels, and particularly unmanned barges, operate in a relatively limited area and conduct many transfers per month, so that unreasonably large numbers of DOI's would accumulate, the COTP may permit the vessel operator to keep only the DOI from the last transfer on board. In most cases, the COTP will be concerned only with the most recent transfer, which may have caused a spill. If more information is required, the facility copy of the DOI is available for one month (in all but vessel-to-vessel transfers). Should a problem arise with a particular vessel, the COTP should directly monitor the vessel's operations closely, rather than rely upon the DOI, to verify routine compliance.

44-2-15G. §156.160 - SUPERVISION BY PERSON-IN-CHARGE

It has been suggested that "immediate vicinity" should be interpreted to permit the person-in-charge to use a shelter off the vessel in bad weather. If the person-in-charge must use a shelter during transfer operations, that shelter must allow for proper observation and supervision of the transfer operation, and operation of the emergency shutdown means.

44-2-15H. §156.170 - EQUIPMENT TESTS AND INSPECTIONS

The high test pressure is intended to expose a weakness or leak under controlled conditions, where corrective action can take place before a spill. Testing to 1.5 MAWP is standard engineering practice and does not damage or destroy a hose which is in good working condition. Testing only to MAWP is not a conclusive indicator of hose condition and is not suitable to determine that a hose is safe for transfer operations. Hose, piping, and loading arms covered by this regulation are not subject to the testing required under 33 CFR 126.15 (o).

A vessel's "oil transfer pipe system" includes the discharge pump and piping or hose between the pump and the vessel's deck manifold (which connects to the facility or other vessel's transfer system). A facility "oil transfer pipe system" extends from the last valve inside containment required by EPA (under 40 CFR 112), through the transfer pipe to the loading arm. The hose that runs between the facility's loading arm and the vessel's deck manifold, or between two vessels' deck manifolds, is subject to subsection (C)(1) and must also be tested to 1.5 MAWP of the hose. The test pressure required for the hose under subsection (C)(1), and for the loading arm and "oil transfer pipe system" under subsection (C)(4) is 225 psi. This figure results from multiplying by 1.5 the MAWP of at least 150 psi, required for facility oil hose assemblies under §154.500, and for vessel oil transfer hose under §155. 800. A test utilizing this pressure will uncover a defect in the hose or pipe system without destroying the tensile strength of oil piping or the hose reinforcement which meets the requirements of §154.500(A) (i.e., a burst pressure of 600 psi).

Problems arise when some barges and vessels cannot pressurize piping to 225 psi outside of a shipyard where special equipment is available, or where transfers are conducted by a vacuum or suction method. The intent of this section is not to require added shipyard periods, but rather to require annual testing (or its equivalent for vessels). Therefore, COTP's may allow alternative pressures (e.g., relief valve pressure plus static head, as in the prior rule) or testing procedures (e.g., vacuum or suction pressure testing) where a 225 psi test is not economically or physically practical under §156.107.

COTP's are reminded of the requirement that the alternative provide an equivalent level of safety and protection from pollution. An alternative to the 225 psi test for hoses should not normally be granted since hoses can be tested with portable equipment.

PART 44-3—MARINE SANITATION DEVICES

▼44-3-1. GENERAL

The EPA issued regulations on 29 January 1976 which revised the Federal standards of performance for marine sanitation devices (MSD's). (See 40 CFR 140.) The regulations apply to all vessels on which toilet facilities have been installed, but do not require the installation of toilet facilities on a vessel which does not already have them. The Coast Guard issued regulations which implement these standards on 12 April 1976. (See 33 CFR 159.) The term MSD includes any equipment for installation on board a vessel which is designed to receive, retain, treat, or discharge sewage and any process which treats such sewage. It does not include "portable devices" which can be carried on and off the vessel. These regulations are effective after 30 January 1977, for new vessels and after 30 January 1980, for existing vessels; however, boat owners may comply earlier. After the effective date of the regulations (or the date of compliance for those vessels which comply early), vessels are exempt from state and local regulation of MSD's, with one exception: a state may completely prohibit the discharge from all vessels of any sewage, whether treated or not, into some or all of the waters within the state by making a written application to the Administrator, Environmental Protection Agency, and by receiving the Administrator's affirmative determination that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available for such waters to which the prohibition would apply. In such waters, flow-through devices must be secured to prevent any discharge to the receiving waters. The new standards of performance, definitions of new and existing vessels, and the timetable for early and regular compliance are set forth in 33 CFR 159.

▼44-3-5. PURPOSE AND AUTHORITY

The purpose of the marine sanitation device (MSD) regulations is to eliminate the discharge of untreated sewage from vessels into the waters of the United States (including the territorial sea). The regulations at 33 CFR 159 are promulgated under the authority of 33 U.S.C. 1322 (section 312 of the FWPCA), and establish procedures and design and construction requirements for MSD's. The regulations apply to vessel owners and manufacturers, and manufacturers of MSD's.

▼44-3-10. MSD CERTIFICATION

All marine sanitation devices (MSD's) must be certified by the Coast Guard. If the device was built before 30 January 1976, it is considered an "existing device." MSD's in this category (except no-discharge devices built before 30 January 1975), were certified by an official letter from the Coast Guard. No-discharge devices constructed before 30 January 1975 were certified by regulation (33 CFR 159.12(b)) without a letter; however, some manufacturers applied for, and received, letters certifying their devices.

If the device was manufactured on or after 30 January 1976, and is Coast Guard certified, it will have a label on it (except for certain no-discharge devices).

No-discharge devices being used solely for the storage of sewage and flush-water at ambient pressure and temperature may be certified by definition (33 CFR 159.12a). Devices certified in this manner cannot be automatically labeled by the manufacturer. However, manufacturers may apply for certification of such devices and thereby may label them as Coast Guard certified. That label gives the certification number and indicates whether the equipment has been type-approved for inspected or uninspected vessels. See CG-485 for an explanation of the Federal MSD regulations.

For more specific guidelines concerning inspection of facilities and vessels for compliance with pollution prevention regulations, refer to chapters 36 and 39, respectively.

Chapter 45--(Reserved)

Chapter 46--(Reserved)

CHAPTER 47—HAZARDOUS MATERIALS SAFETY PROGRAM

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PART 47-1—HAZARDOUS MATERIAL SAFETY PROGRAM—GENERAL

47-1-1. INTRODUCTION

The hazardous material safety program is concerned with those materials (solids, liquids, and gases) that are dangerous to human life and property. It is important to note the distinction between hazardous *materials* and hazardous substances. Hazardous substances are those products identified by the Administrator of the Environmental Protection Agency (EPA) because of their potential threat to the marine environment. For example, LNG is clearly a "hazardous material," yet is not a "hazardous substance." On the other hand, a material like molasses could be designated a hazardous substance because of its potentially adverse effect on the marine environment, but it would not be considered a hazardous material. The vast majority of hazardous materials, however, are also hazardous substances, so there is a great deal of commonality in the lists of regulated products. The laws and regulations for these two groups of products will obviously overlap to a great degree.

The hazardous material safety program is basically divided into two main areas. One area is "bulk" liquids and gases; the other is loosely referred to as "packaged" cargoes. For the purpose of distinguishing between "bulk" and "package" shipments, the phrase "carried in bulk" means a commodity that is loaded or carried on board a vessel without containers or labels and that is received and handled without mark or count.

The definition of hazardous materials varies, depending on whether packaged or bulk cargoes are involved. The definition of a hazardous material under the Hazardous Materials Transportation Act of 1974 (49 U.S.C. 1801) (i.e., for packaged cargo) is "a substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated" (see 49 CFR 171.8). This is obviously a very broad definition in that it includes many commodities that are not referred to as "hazardous materials" when carried in bulk. The "bulk" definition does not originate in the law and has evolved through usage to mean a material that has hazards other than, or in addition to, those of normal petroleum products. Gasoline, therefore, is considered to be a hazardous material under the "package rules," but is not a hazardous material under the "bulk rules."

It is important to point out that these differences are in terminology only, and should not lead one to the conclusion that gasoline or other petroleum products are not hazardous when carried in bulk. The use of the phrase "hazardous materials" in the bulk terminology is used to distinguish between those products regulated under 46 CFR Parts 30–40 (Subchapter D—Tank Vessels) and those regulated under 46 CFR Parts 150–157 (Subchapter O—Certain Bulk Dangerous Cargoes). In fact, many more serious accidents involve the "normal" petroleum products than the hazardous materials under 46 CFR subchapter O.

Authority for the regulation of hazardous materials also varies, depending on whether the materials are shipped in "bulk" or "package." Bulk shipments are regulated exclusively by the Coast Guard, while the Materials Transportation Bureau (MTB) of the U.S. Department of Transportation (DOT) has authority for package shipments. The regulations for bulk shipments are found in title 46 of the Code of Federal Regulations (CFR), and the regulations for package shipments are found mainly in title 49 CFR, although a few remain in title 46 CFR. (There is presently a regulatory project at Headquarters to remove all package regulations from title 46 CFR and transfer them to title 49 CFR.)

As previously mentioned, there are other methods of carriage of hazardous materials that do not fall within the two broad classifications of "bulk" and "package." These include solids carried in bulk (i.e., carried in the holds of cargo vessels rather than in some form of package), military explosives, ships' stores, and fumigated cargo. At Headquarters, bulk liquids and liquefied gases are handled by the Chemical Engineering Branch, Commandant (G-MHM-1); while packaged shipments, bulk solids, military explosives, ships' stores, and fumigated cargo are the responsibility of the Cargo Systems Branch, Commandant (G-MHM-2). Both branches are located in the Cargo and Hazardous Materials Division, Office of Merchant Marine Safety.

A similar division of responsibility exists within the Inter-Governmental Maritime Consultative Organization (IMCO). The IMCO Subcommittee on Bulk Chemicals (BCH) has responsibility for the Bulk Chemical Code and the Gas Ship Codes, while packaged cargoes are the responsibility of the IMCO Subcommittee on the Carriage of Dangerous Goods (CDG). The latter group is responsible for the IMCO Dangerous Goods Code. IMCO has a Subcommittee on Containers and Cargoes which deals with solids in bulk and containerized shipments. See subpart 47–1–10 below for a more thorough discussion of the various international codes and conventions.

See also table 47–1–1.1 for a summary of the references and information concerning the hazardous material safety program.

47–1–5. REFERENCES

47–1–5A. LAWS

There are two basic laws under which the Coast Guard issues regulations governing the bulk shipment of hazardous materials. These are the Dangerous Cargo Act (46 U.S.C. 170 *et seq.*) and the Ports and Waterways Safety Act (46 U.S.C. 391a), as amended by the Port and Tanker Safety Act of 1978. A third law, the Hazardous Materials Transportation Act of 1974 (49 U.S.C. 1801), authorizes the Director of the Materials Transportation Bureau (MTB) in the U.S. Department of Transportation (DOT) to issue regulations for packaged shipments of hazardous materials. The MTB has authority to issue regulations for the water-mode transportation of packaged hazardous materials under the Dangerous Cargoes Act. While the Coast Guard enforces those regulations and can recommend amendments, etc., it is not authorized to issue the regulations or to permit exemptions.

The relevant provisions of the Dangerous Cargo Act are reprinted in *Laws Governing Marine Inspection* (CG-227). An important provision of this law is that it applies to foreign vessels while in U.S. waters as well as to U.S. vessels.

Although the Port and Tanker Safety Act of 1978 applies to foreign vessels in U.S. waters, it does permit the Coast Guard to accept a valid certificate of inspection issued by the vessel's flag administration in lieu of a Coast Guard-issued certificate. The certificate must indicate that the vessel meets standards reasonably equivalent to those which a U.S. vessel must meet. This provision is similar to 46 CFR 30.01–5(e), wherein a foreign tanker is exempt from most of the 46 CFR subchapter D regulations if it has a valid SOLAS Certificate.

47–1–5B. REGULATIONS

Under 46 CFR parts 153 and 154, the Coast Guard has recognized IMCO Certificates of Fitness issued in accordance with the Bulk Chemical Code and the Gas Ship Code for new ships, together with SOLAS certificates, as essentially equivalent to a Coast Guard Certificate of Inspection, with some exceptions. Evidence of these documents allows the issuance of a Letter of Compliance to such vessels without the need for Coast Guard plan review. It does not mean, however, that these vessels will meet the regulations in 46 CFR parts 153 and 154 in every detail. Again, the situation is analogous to the foreign oil tanker and 46 CFR subchapter D regulations. The Coast Guard has determined that possession of a valid SOLAS certificate is reasonably equivalent to meeting the design and equipment requirements of 46 CFR subchapter D. The foreign oil tanker, however, may not meet every detail of these regulations. On foreign chemical and gas ships, the inspectors may find apparent discrepancies between 46 CFR parts 153 or 154 and the actual vessel, because the vessel has been built to the standards in the appropriate IMCO Code. (See section 47-2-5C of this chapter for complete information concerning the interpretation and application of the regulations in 46 CFR part 153.)

A similar situation exists where packaged cargo is concerned. The regulations in 49 CFR Parts 170-179 (Subchapter C — Hazardous Materials Regulations) apply to foreign vessels as well as to U.S. vessels. As noted in 49 CFR 176.11, a packaged cargo shipped on a vessel in accordance with the recommendations of the IMCO Dangerous Goods Code is acceptable.

The regulations for bulk and packaged hazardous materials differ in the way that a hazardous material is permitted to be offered for shipment by water. A bulk liquid or liquefied gas must be evaluated by Commandant (G-MHM) before it is authorized for shipment. A determination is made as to whether the material may be shipped in bulk and, if so, how it is to be shipped. The fact that a bulk liquid or liquefied gas is not listed as being regulated *does not* mean that it is unregulated. In fact, it may mean that the cargo is not allowed to be shipped in bulk.

If a new material is to be shipped as a packaged cargo, the shipper determines if it is a hazardous material or not and, if it is, selects the proper classification himself. There are, however, some cargoes that are listed in the regulations as not allowed to be shipped.

47-1-5C. TELEPHONE NUMBERS

The package rules state that unless the regulations prohibit its shipment, a material can be shipped under one of the many "not otherwise specified" (N.O.S.) categories. The bulk rules state that unless the regulations permit its shipment, a material cannot be carried in bulk without specific approval of the Commandant. Since new products are added on an almost daily basis, any list published in the Federal Register will probably be out of date quickly. When in doubt, Commandant (G-MHM) should be contacted. If the cargo is to be shipped in bulk and is a liquid or gas, the Hazard Evaluation Branch, Commandant (G-MHM-3), should be contacted at FTS: 8-426-1019. If the cargo is packaged or is a bulk solid, the Cargo Systems Branch, Commandant (G-MHM-2), should be contacted at FTS: 8-426-1577. During off-duty hours, the appropriate Headquarters branch chief or his representative may be reached by calling the Flag Plot Duty Officer, Commandant (G-OFP), at FTS: 8-426-1830.

47-1-5D. WATERFRONT FACILITIES

The Ports and Waterways Safety Act, as amended by the Port and Tanker Safety Act of 1978, also makes the Coast Guard responsible for the safety of waterfront facilities which handle hazardous materials. Chapter 36 of this manual addresses the inspection of facilities and structures for safety and pollution prevention.

47-1-10. INTERNATIONAL CODES AND CONVENTIONS

▼47-1-10A. INTRODUCTION

Before discussing the various international codes and conventions applicable to hazardous materials, it is important to understand the difference between a code and a convention. A code is basically a *recommendation* to governments to adopt certain standards. It is not legally binding under international law, and Senate ratification is not required for the U.S. to adopt it. Other nations may "adopt" it, but they do not "ratify" it or become "signatory." A convention, on the other hand, is binding under international law and requires Senate ratification.

The codes which are of interest for the bulk carriage of hazardous materials are:

(1) The Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Assembly Resolution A.212(VII), adopted 12 Octo-

ber 1971. This Code is generally referred to as the IMCO Chemical Code.

(2) The Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, Assembly Resolution A.328 (IX), adopted 12 November 1975. This Code applies only to new gas ships (as defined in the Code) and is normally called the IMCO Gas Code for new ships.

(3) The Code for Existing Ships Carrying Liquefied Gases in Bulk. This Code applies to the ships which are not covered by the IMCO Gas Code for new ships.

These Codes are recommendatory. In order to become effective, the Coast Guard must publish regulations that adopt them in whole or in part. It has been the Commandant's policy to adopt the Codes as minimum standards and to exceed them only for good cause. Because the Codes are drafted by an international body, they are sometimes very loosely worded or vague in order to satisfy all delegations. When the Coast Guard drafts regulations to implement the Codes, language must be as detailed and specific as possible. Sometimes this specificity appears to exceed the requirements of the Code. For example, the IMCO Chemical Code requires that filling pipes extend to "near the bottom of the tank," while the corresponding U.S. regulation requires that they "must extend to within four inches or the fill pipe radius of the bottom of the tank." The Coast Guard's intent was not to exceed the Code, but rather to give specific guidance to designers as to what would be considered "near the bottom."

Foreign ships built to the IMCO Chemical Code would not necessarily meet Coast Guard regulations, nor would they be expected to. As an example, if it were found that a foreign vessel's filling pipe terminated near the bottom of the tank, although not specifically meeting Coast Guard regulations, its IMCO Certificate of Fitness would be accepted under the Letter of Compliance Program.

See plate 47-1-10A.1 for information concerning the effective dates of these IMCO Codes in relation to current U.S. regulations.

The IMCO Codes are available from the following sources:

(1) IMCO Secretariat
Publications Section
101-104 Piccadilly
London W1V OAE
TELEX: 23588

(2) New York Nautical Instrument
and Service Co.
140 West Broadway
New York, N.Y. 10013

(3) Southwest Instrument Co.
235 West 7th. St.
San Pedro, CA. 90731

Amendments to the Codes are made from time to time as necessary.

47-1-10B. THE IMCO CHEMICAL CODE.

This Code was adopted in October 1971 and became effective on 12 April 1972. It applies to tankships carrying liquid chemicals in bulk. It was somewhat unique when adopted because it required extensive upgrading of existing ships. The requirements for upgrading were phased in over a period of six years. With the exception of damage stability and midship deck house arrangements, an existing ship was required to meet the same requirements as a new ship as of 12 April 1978. The Coast Guard's implementing regulations are found in 46 CFR Part 153 (Safety Rules for Self-propelled Vessels Carrying Hazardous Liquids). Due to delays in publishing these regulations, the effective date of the regulations in 46 CFR part 153 is different than the effective date of the IMCO Chemical Code. This has resulted in some confusion as to what constitutes an existing ship under U.S. regulations. IMCO defines an existing ship as one whose keel was laid before 12 April

1972. The regulations in 46 CFR part 153 define an existing tankship as one for which a contract was let on or before December 27, 1977.

An existing tankship with a midships deck house containing accommodations may continue to operate, while new tankships are not allowed to have accommodations forward of any cargo tank. Midship accommodation houses are prohibited on tankships built since 1975 (see 46 CFR 32.56-5).

Damage stability for existing tankships is addressed in 1.7.2(d)(ii) and (iii) of the IMCO Chemical Code and in 46 CFR 153.7(c) as follows:

(1) An existing type III ship (i.e., a single-hulled vessel carrying cargoes requiring type III containment) is not required to meet the damage stability requirements.

(2) An existing single-hulled vessel that is required by the Chemical Code to install double bottoms and side tanks in order to *continue* carrying type II cargoes should have its damage stability evaluated to insure that it is not impaired by the modifications.

(3) An existing double-hulled vessel carrying type II cargoes is not required to evaluate damage stability and is allowed relaxation of the bottom and side tank location clearances, except that the double bottom height must not be less than 760 mm.

(4) An existing type III ship that is being modified to enter into the carriage of type II cargoes would be required to meet the damage stability requirements of 2.2.4 of the Chemical Code in the cargo area, but would not be required to survive damage to the main machinery space.

(5) Existing type I ships are required to meet the damage stability requirements for new ships, but may be allowed minor relaxations of the side and bottom tank separation distances.

In effect, the above items mean that existing chemical tankers are not required to have their damage stability investigated, unless their cargo tank configuration is modified.

As previously noted, the Commandant is waiving plan review on chemical tankers that have a valid IMCO Certificate of Fitness (COF). Furthermore, a foreign chemical tanker is required to have a COF in order to obtain a Letter of Compliance, unless the flag administration does not issue IMCO certificates. However, this does not mean that foreign vessels have the option of getting an IMCO COF or undergoing plan review. Thus, except for unusual cases, LOC chemical tankers will be designed and equipped in accordance with the Code. Therefore, they should also comply with the operating requirements in the Chemical Code, as well as those requirements in 46 CFR part 153. The inspector should be familiar with the IMCO Chemical Code since it will be his primary guide when examining LOC chemical tankers.

The IMCO Chemical Code, as well as its format to some extent, was based on the U.S. regulations for unmanned barges in 46 CFR Part 151 (Unmanned Barges Carrying Certain Bulk Dangerous Cargoes). The use of hull types, the table summarizing minimum requirements, and the referencing of special requirements for individual cargoes will be familiar to the users of the regulations in 46 CFR part 151.

Like the regulations in 46 CFR part 151, the IMCO Chemical Code identifies three hull types. Type I is for the most hazardous cargoes, Type III the least. (It should be noted that there is no direct correlation between a ship hull type and a barge hull type. That is, because a cargo is required to be carried in a Type I barge does not mean it must be carried in a Type I ship.) The ship hull type designation tells you the following three things about the ship, in addition to the relative degree of hazard of the cargo:

(1) The extent of hypothetical damage the ship is capable of sustaining and still remain afloat in a condition of positive equilibrium. This consideration

is merely a calculation standard used by naval architects in assessing the survival capability of a ship. It is only important during plan review and is of little concern to the inspector. The two remaining criteria, however, specified by the hull type, *are* of interest to the inspector.

(2) The hull type specifies the cargo tank location within the hull. For example, a Type II cargo is required to be carried in a tank 760 mm inboard of the hull and at a distance above the bottom equal to or greater than the vessel's beam divided by 15 (B/15) *or* 6 meters, whichever is less. Thus, a Type II ship can carry Type II cargoes in center tanks that have double bottoms. Type III cargoes could be carried in the wing tanks, since there is no restriction on cargo tank location for Type III cargoes.

(3) The hull type also tells you the maximum quantity of cargo that can be loaded in a tank. Type I cargoes are limited to 1250 m^3 per tank, Type II is limited to 3000 m^3 per tank, and there is no restriction on Type III cargoes. Note that these are *loading* restrictions, *not* tank size limitations.

The Table of Minimum Requirements, contained in chapter 6 of the IMCO Chemical Code, summarizes the *minimum* and *special* requirements for the products listed. For quick reference, products are listed alphabetically by their generic name. An explanation of the abbreviations used in the table are also contained in chapter 6 of the Chemical Code. There are several abbreviations, however, that need further clarification. Explanations are provided as follows:

(1) TANK VENTS – Tank venting is identified as either "controlled" (meaning a pressure-vacuum valve or, in some cases, a safety relief valve) or "open" (e.g., gooseneck vent).

(2) TANK ENVIRONMENTAL CONTROL – This column is not self-explanatory since the word "yes" sometimes appears with no explanation as to what is required. The regulations in 46 CFR part 153 should be consulted to determine applicable requirements.

(3) ELECTRICAL INSTRUMENTS – Special requirements, identified by "SP," are not contained in the Chemical Code. This matter is currently under review at IMCO.

(4) VAPOR DETECTION – The vapor detection requirements are specified as no detection, flammable vapor detection, toxic vapor detection, or both of the latter two. The detectors do not have to be permanently installed types, but rather may be reagent-tube-and-aspirator types.

Note: For some toxic substances, toxic vapor detection equipment is not currently available. The "uniform interpretation" of paragraph 3.11 of the Chemical Code allows the substitution of additional breathing air supplies when toxic vapor detection equipment is not commercially available. The Certificate of Fitness should indicate when this substitution has been allowed.

Fire protection requirements are identified as to the type of medium (e.g., foam, water spray, or dry chemical), but no other particulars such as amount, distribution, coverage, etc., are specified. More detailed fire protection requirements are being developed by the IMCO Subcommittee on Fire Protection. In the meantime, individual administrations must approve installations based on their own guidelines. Finally, the last column references the user to special requirements for individual products.

As can be seen from the foregoing, the IMCO Chemical Code leaves many areas subject to interpretation. The Commandant, therefore, was obliged to add as much detail as possible to the implementing regulations, 46 CFR part 153. Other administrations may have issued their own regulations which may have different detailed requirements aimed at the same intended goal. It is necessary to use the Chemical Code and the U.S. regulations in 46 CFR part 153 when inspecting a foreign chemical tanker. The Code should be used as the primary reference with the regulations providing guidance for the U.S. interpretation of the requirements of the Code. The regulations *should not*, however, be used for strict letter-for-letter inspections on foreign ships.

Navigation and Vessel Inspection Circular (NVC) 3–78 provides a convenient, two-way, cross-reference list between sections of the Chemical Code and 46 CFR part 153.

47–1–10C. THE IMCO GAS CODE FOR NEW SHIPS

After IMCO developed the Bulk Chemical Code, it undertook the development of a code for liquefied gas ships. At the outset it was agreed that the code would apply only to new ships so that the problems of upgrading existing ships would then be avoided. Because of some of the difficulties that became apparent with the vagueness of the Chemical Code, and also because the U.S. had much more detailed requirements for gas ships as well as the knowledge that the requirements did not have to be "loose" enough to accommodate existing ships, the IMCO Gas Code is much more detailed. This higher degree of specificity was one of the primary goals of the U.S. in negotiating the development of the Code. Still, because of the nature of international agreements, there remains some degree of vagueness.

The IMCO Gas Code follows the same philosophy as found in the IMCO Chemical Code and in 46 CFR parts 151 and 153. There are four ship types instead of three, but one of them is really a special category of Type II, called Type IIPG. The hull types carry the designation "G" to distinguish them from chemical tankers. The damage stability is similar to chemical tankers except that a greater final angle of heel after damage is allowed. The tank location requirements for Type IG and Type IIG/IIPG are the same as for Type I and Type II chemical tankers. Type IIIG gas ships, however, are required to have the tanks at least 760 mm inboard of the hull, as opposed to no separation on Type III chemical tankers. There is no cargo quantity limitation on Type IG and Type IIG/IIPG cargoes as there is on chemical tankers.

A comparison of the Gas Code to the Chemical Code will reveal much more detailed requirements for tank and piping design, materials, venting, electrical equipment, fire protection, and instrumentation.

Chapter XIX of the Gas Code contains a Table of Minimum Requirements and references to special requirements for individual cargoes. The ship type is specified for each cargo, with most requiring Type IIG or IIPG ships. As a practical matter, there are no Type IIIG ships and few, if any, Type IG ships. Type IIPG ships, which are small ships with pressure vessel tanks, can carry most cargoes that a Type IIG ship can. The exceptions are cargoes with very low critical temperatures, such as methane and ethane.

The cargoes that are required to be carried in pressure vessel type tanks and those that are required to have inerted or dried atmospheres above the cargo are identified in columns d and e of the Table of Minimum Requirements. The vapor detection requirements are similar to those in the Chemical Code except that the flammable gas detectors and toxic vapor detectors for certain cargoes are required to be the permanently installed, automatic monitoring type. Gauging is the same as the Chemical Code, except that there is no provision for an open gauge. The special requirements are treated in a manner similar to the Chemical Code. It is interesting to note that the alkanes and alkenes (methane, propane, ethylene, etc.) have no special requirements. This is due to the fact that the body of the Gas Code was drafted around LNG/LPG ships. Thus, they are the "normal" cargoes, with special requirements to accommodate the other cargoes that have different properties.

The cargo chlorine appears in the Gas Code and the first amendment to the Code contains detailed special requirements for its carriage. It is possible that anhydrous hydrogen fluoride will be added in the near future. Neither of these cargoes are permitted to be carried on self-propelled vessels in the United States. As a result, while they may appear in the Gas Code, they will not appear in the implementing Coast Guard regulations, 46 CFR part 154.

Because of the details contained in the IMCO Gas Code, the regulations in 46 CFR part 154 follow the Gas Code much more closely than was possible with the Chemical Code. There are some major differences, however. There were four major issues on which the U.S. was not able to obtain international agreement during the development of the Gas Code. Since these issues were considered essential to safety, the Coast Guard has had to exceed the provisions of the Gas Code. These four areas are:

(1) A higher factor of safety to be used in the design of pressure vessel tanks and Type B tanks (e.g., large spherical LNG tanks);

(2) Lower design ambient temperatures for inner hull steel selection;

(3) Crack-arresting steels in the sheer strake, stringer plate, and the turn of the bilge; and

(4) The venting of a cargo to atmosphere under manual operations to control temperature and pressure is prohibited.

NOTE: This fourth area where the Coast Guard regulations exceed the Gas Code is often misunderstood as a prohibition of venting of gas tanks under *all* circumstances. The Gas Code makes provision for controlling cargo pressure and temperature by venting of cargo. In fact, some of the early LNG ships disposed of their boil-off vapors by mixing them with air and venting them to the atmosphere. The Coast Guard does not permit this type of cargo pressure control.

For all cargoes except methane, a vessel is required to have a refrigeration/reliquefaction system *or* have its tanks designed to withstand the cargo's vapor pressure at 45°C. Methane boil-off is required to be either reliquefied (to date this has not proven economically feasible) or burned in the boilers or main engines. Other means of disposal such as combustion in an incinerator are also allowed, but not used as yet. Venting under certain controlled operations, such as gas trials, may be allowed. Emergencies may also dictate the necessity to control cargo temperatures and pressures by atmospheric venting.

The above four areas are the only ones in which the Coast Guard has found it necessary to exceed the Gas Code. Details were added to clarify some of the Code's recommendations and, wherever possible, specific requirements have replaced wording such as "as close as practicable" and "the design should consider."

The Gas Code applies only to "new" ships. Toward the end of the development of the Code, several nations became concerned that existing ships might be barred from some ports if they did not have IMCO certificates. IMCO, therefore, developed the Code for Existing Ships Carrying Liquefied Gases in Bulk. This Code applies to the ships which were not covered by the IMCO Gas Code for new ships.

47-1-10D. THE IMCO GAS CODE FOR EXISTING SHIPS

This Gas Code for existing ships is similar to the Gas Code for new ships, but some of the most important considerations of the new Code are significantly relaxed. For example, the requirements for cargo tank design, materials of construction, and piping design and construction are much reduced for existing ships, and damage stability is not required on existing gas ships. Basically, this Code reflects the way gas ships were built and was not intended to require major upgrading.

Unlike the Gas Code for new ships, the Gas Code for existing ships does not make a distinction between cargo and hull types. Existing ships are allowed to carry the products listed in chapter 19 of the Gas Code for existing ships. These products correspond to the Type II and III cargoes listed in chapter 19 of the Gas Code for new ships. It should be noted that Type I cargoes are excluded from the Gas Code for existing ships. This omission was intentional and not an oversight. Only ships designed and constructed to the Code for new ships will be considered for the carriage of Type I cargoes, such as ethylene oxide, methyl bromide, and sulfur dioxide.

The Gas Code does require some upgrading of existing ships, particularly in the way of instrumentation and fire protection. The upgrading will be accomplished in two steps; some requirements must have been met on 31 October 1978, the remainder on 31 October 1982.

Because the Code for existing ships generally sets a lower standard for gas ships than was required under the LOC program, the Coast Guard does not plan to fully adopt it. A note to this effect was placed in the Preamble to the Code. The words "The Code is not meant to replace any controls which may already be in operation" refer to the LOC program. When the Code requires upgrading of existing ships, the Coast Guard will adopt those provisions.

47-1-10E. RECOMMENDATIONS CONCERNING SHIPS NOT COVERED BY THE GAS CODE FOR NEW SHIPS

The Gas Code for existing ships was primarily aimed at ships already in service. Although the applicability of the Gas Code for new ships and the Gas Code for existing ships include all gas ships, there is really a third category of gas ships. This category includes those ships that were or are under construction but to which the Code for new ships is not strictly applicable. It was IMCO's intent, as stated in Resolution A.329 (IX), that ships under construction should meet the Gas Code for new ships as far as possible, taking into account the stage of construction. Such ships would, of course, have to meet the Gas Code for existing ships, as a minimum.

47-1-10F. INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) CODE

The International Maritime Dangerous Goods (IMDG) Code was developed by IMCO to aid governments in applying the requirements of chapter VII of the SOLAS 60 Convention and implements the United Nations' recommendations on the transport of dangerous goods for the water mode. The U.N. recommendations are prepared by the "Committee of Experts on the Transport of Dangerous Goods" and are contained in the U.N. publication entitled *Transport of Dangerous Goods*. They are multimodal recommendations for classification, marking, labeling, packaging, and placarding of hazardous materials. The IMCO Subcommittee on the Carriage of Dangerous Goods uses these recommendations and prepares stowage and segregation requirements and other requirements peculiar to the water mode of transportation. The IMDG Code is the result of this work and contains information similar to that found in 49 CFR Parts 170-179 (Subchapter C — Hazardous Materials Regulations) as far as water shipments are concerned. The field marine safety unit will not normally be concerned with the U.N. publication listed above but may have a very definite need for the IMDG Code.

Since the title 49 CFR "package regulations" have incorporated the IMCO recommendations for the most part (there are some intentional important differences), the use of the title 49 regulations is not mandatory, and shippers who move packaged goods in U.S. ports for international shipment are permitted to use the IMDG Code. This is necessary from the shipper's point of view in order to facilitate acceptance of his package on "the other end." An important distinction to note is that while IMCO classification, marking, labeling, packaging, and placarding may be used, the stowage and segregation must be in accordance with title 49 CFR (i.e., the DOT regulations). IMCO stowage and segregation requirements were incorporated into the DOT regulations to the greatest extent possible by the use of column 7(c) "Other requirements" of 49 CFR Table 172.101 (Hazardous Materials Table).

For approximately 90 percent of the time, there will be no difference between IMCO and DOT requirements for segregation and stowage. However, because stowage is based on the name of the individual substance rather than the class, different stowage requirements sometimes result. The ten-percent difference generally represents minor variations and can often be handled by the COTP through approval of alternate stowage procedures authorized under 49 CFR 176.65.

Another important difference is in the handling of explosives. DOT uses three classes of explosives (A, B, and C), while IMCO has five divisions. Explosives, therefore, are required to be shipped under DOT regulations rather than the IMDG Code. A similar difference exists with radioactive materials; and these, too, may not be shipped using IMCO's classification, labeling, etc. In spite of these differences, the majority of import/export packaged shipments may be classified, labeled, marked, packaged, and placarded under the IMDG Code. For this reason, the IMDG Code is incorporated in title 49 CFR by reference (see 49 CFR 171.7).

It is important to note which edition of the IMDG Code is referenced and which amendments to the Code have been included in the adoption by reference. The IMDG Code was originally a three-volume set and has been amended 16 times. Because of the awkwardness of using the Code and all its separate amendments, IMCO has recently republished the IMDG Code with the first 13 amendments incorporated. This version is in loose-leaf form and consists of four volumes. Currently, the title 49 regulations have only incorporated the four-volume version with the first 13 amendments, which has an effective date of 1 September 1978. As the additional amendments are published and become effective, they will also be incorporated by reference.

The IMDG Code begins with a general introduction that explains its purpose and application, identifies nine classes of dangerous goods, and gives general requirements for testing, shipping documents, classification, marking, labeling, packaging, freight container transport, portable tanks, stowage, and segregation. Following the introduction, each class of dangerous goods is treated separately. The section for each class gives specific requirements for marking, labeling, etc., which are particular to that class. Each commodity or group of similar commodities are then listed on a separate page. Each page gives a limited description of the product and its properties, its chemical formula where appropriate, the United Nations' number, and several synonyms. "Observations" or general information that may be helpful are also listed. An example of the proper label and the packing and stowage requirements are also given. It should be noted that the packaging (or "packing") is much less detailed than in DOT regulations.

IMCO is working to improve the recommendations for packaging, but it is using a performance-test approach rather than outlining detailed specifications for the container as does DOT. IMCO's packages will fall into three groups, with Group I packages subject to the most stringent performance tests and Group III the least. In fact, Group III packaging is used for products of little hazard that are generally not regulated under DOT.

Often the entry for packaging is "Receptacles approved by the competent authority of the country concerned." In other areas of the IMDG Code, IMCO requires specific approval by the "competent authority." In these cases, Commandant (G-MHM) will issue the proper certificate. It should be borne in mind that this is not an "exemption," since the shipment is in accordance with U.S. law. If a shipper approaches a local field marine safety unit for a "competent authority certificate," he should be directed to contact Commandant (G-MHM-2), telephone (202) 426-1577.

47-1-10G. RECOMMENDATIONS ON THE SAFE USE OF PESTICIDES IN SHIPS

The Maritime Safety Committee of IMCO has issued Circular 108 (Recommendations on the Safe Use of Pesticides in Ships) as useful information to mariners and administrators on the safe use of pesticides and rodenticides on board ships. This Circular is of interest to the Coast Guard because of the possible health and safety hazards of fumigation to the ship's crew and other personnel who may be on board, including Coast Guardsmen.

For shipboard fumigation, the Coast Guard has developed regulations which are contained in 46 CFR Part 147A (Interim Regulations for Shipboard Fumigation). (See part 47–11 of this chapter for information concerning fumigation.)

47–1–10H. MARPOL 73, ANNEXES II AND III

Annex II of the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73) applies to "noxious liquid substances" carried on tankers. The list of these substances is very similar to the EPA list of "hazardous substances." The Annex is a mandatory one; i.e., any country ratifying the basic MARPOL Convention must also adopt Annex II. The intent of the Annex is to limit and control the discharge of hazardous substances into the sea during normal operations (e.g., tank cleaning). It is not aimed at accidental spills as are the EPA regulations on hazardous substances.

An important provision of Annex II is that a ship carrying Annex II products must comply with and be certificated under the IMCO Bulk Chemical Code. In effect, the Annex upgrades the IMCO Chemical Code from its status as a recommendation to international law. It should be noted that not all products regulated by the IMCO Chemical Code are included in Annex II (the reverse will not be true as all Annex II products must be added to the IMCO Chemical Code).

IMCO is still developing many of the details associated with Annex II. Because of this there has been international agreement that Annex II will not come into force until three years after the basic Convention (MARPOL 73).

Annex III to MARPOL 73 applies to hazardous substances carried in packaged form, but is not a mandatory Annex. Thus, the Convention does not upgrade the IMDG Code to Convention status. An important provision of Annex III, that may become significant if countries do adopt it, is that shipping documents must differentiate between "dangerous goods" and "hazardous substances."

Neither Annex is in force at this time, and the details associated with their implementation have not been developed.

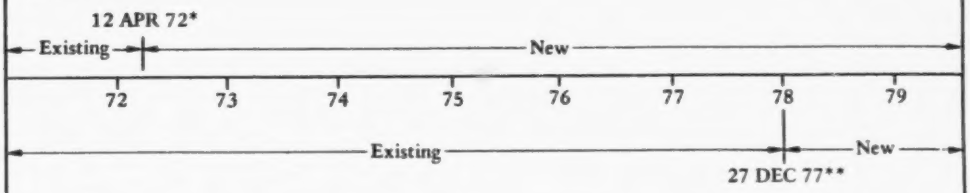
TABLE 47-1-1.1
SUMMARY OF INFORMATION CONCERNING THE
HAZARDOUS MATERIAL SAFETY PROGRAM

	Bulk Liquids and Gases	Packaged Cargoes, Including Portable Tanks	Bulk Solids	Fumigation	Ships' Stores
Cognizant Headquarters Branch and Telephone Number	Chemical Engineering (G-MHM-2) FTS: 8-426-1217	Cargo Systems (G-MHM-2) FTS: 8-426-1577	Cargo Systems (G-MHM-2) FTS: 8-426-1577	Cargo Systems (G-MHM-2) FTS: 8-426-1577	Cargo Systems (G-MHM-2) FTS: 8-426-1577
Agency with Authority	Coast Guard (CG)	Materials Transportation Bureau (MTB)	CG	CG	CG
Applicable Law(s)	33 U.S.C. 1221 46 U.S.C. 170 46 U.S.C. 391a	46 U.S.C. 170 49 U.S.C. 1801	33 U.S.C. 1221 46 U.S.C. 170	46 U.S.C. 170	46 U.S.C. 170
Applicable Regulations	33 CFR Subchapter O 46 CFR Subchapters D and O	46 CFR Parts 64 and 98 49 Subchapter C	46 CFR 148	46 CFR Part 147a	46 CFR Parts 147 and 194
Corresponding International Code or Convention	Bulk Chemical Code (Res. A. 212), Gas Carrier Code (Res. A. 328) for Existing Ships.	Dangerous Goods Code, U.N. Transport of Dangerous Goods		Maritime Safety Committee Circular 108	
Marine Safety Manual (CG-495)	Parts 47-1 through 47-5	Part 47-7	Part 47-6	Part 47-11	Part 47-10

PLATE 47–1–10A.1
IMPLEMENTATION DATES FOR IMCO CODES AND U.S. REGULATIONS

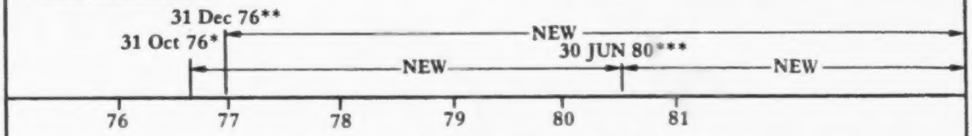
The following diagrams show the "break-points" for defining "New" and "Existing" ships as written into the IMCO Codes and U.S. regulations. It should be noted that the effective dates for chemical ships is the only instance where IMCO Codes and U.S. regulations differ in dates.

CHEMICAL SHIPS



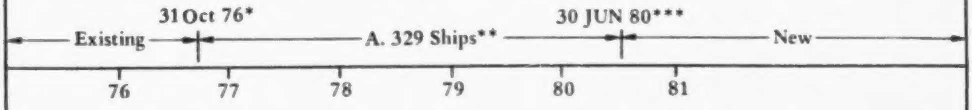
*IMCO RES.A.212(VII)–Based on date keel laid.
**46 CFR 153–Based on building contact date.

"NEW" GAS SHIPS



*IMCO RES. A.328(IX)/46 CFR 154–Based on building contract date.
**IMCO RES.A.328(IX)/46 CFR 154–Based on date keel laid.
***IMCO RES.A.328(IX)/46 CFR 154–Based on delivery date.

"EXISTING" GAS SHIPS



*IMCO Existing Gas Ship Code/USCG ANPRM dtd 6/30/77–Based on delivery date.
**Ships falling under IMCO RES. A.329(IX).
***IMCO RES. A.329(IX)/46 CFR 154–Based on delivery date.

MARINE SAFETY MANUAL (CG-495)

PART 47-2—BULK LIQUID CHEMICALS

47-2-1. GENERAL

47-2-1A. INTRODUCTION

The liquid chemicals regulated as "hazardous materials" under 46 CFR Parts 150–157 (Subchapter O—Certain Bulk Dangerous Cargoes) have one or more of the following properties:

(1) Unusual flammability (i.e., wider flammable limits, lower flash point, lower auto-ignition temperature, etc., than those associated with normal petroleum products).
(2) Toxicity (chronic or acute).
(3) Corrosivity.
(4) Self-reactivity (polymerization).
(5) Instability or unusual reactivity.
(6) Pyrophoricity.

47-2-1B. HAZARD EVALUATION

Before a new product is shipped in bulk, the shipper or manufacturer must supply a completed Form CG-4355, Characteristics of Liquid Chemicals Proposed for Bulk Water Movement, to the Hazard Evaluation Branch, Commandant (G-MHM-3). The data on this form, along with other information in the literature about the product, is then evaluated. Based on the properties of the product, a decision is made to place it in one of the following four categories:

(1) Flammable or combustible liquid regulated under 46 CFR subchapter D;
(2) Hazardous material under 46 CFR subchapter O;
(3) Too dangerous to be shipped in bulk; or
(4) "Unregulated."

If a product which is offered for shipment or is being shipped is not included within one of the above four categories and the shipper cannot produce written authorization from the Commandant, Commandant (G-MHM-3) can be contacted by telephoning FTS: 8-426-1019. Until the product has been evaluated and authorized for shipment, it is considered prohibited for bulk carriage.

If the product falls within the purview of 46 CFR subchapter O, tentative minimum requirements for its safe carriage are developed. The shipper and all district commanders (m) are advised by the Commandant of these requirements by letter. This procedure is used in order to facilitate the movement of the product, rather than waiting for formal adoption of the minimum requirements as a final rule. Eventually, however, the product is included in 46 CFR table 151.05 and/or table 1 of 46 CFR part 153.

If the product hazard is solely one of flammability or combustibility, it is assigned to 46 CFR subchapter D, unless it possesses unusual flammability characteristics such as low auto ignition temperature or wide flammable limits, in which case it is assigned to 46 CFR subchapter O. Note, however, that the definitions of "flammable" and "combustible" in 46 CFR subchapter D are different from those in the "package rules." A list of products regulated by neither 46 CFR subchapter D nor 46 CFR part 153 is given in appendix I to 46 CFR part 153. The cargoes that have been evaluated and found too dangerous to transport in bulk are:

(1) Acrolein;
(2) Chlorine (applies to self-propelled vessels only);
(3) Ethylenimine;
(4) Hydrofluoric Acid;
(5) Hydrogen;
(6) Hydrogen Chloride;
(7) Hydrogen Fluoride;
(8) Hydrogen Peroxide;
(9) Methylcyclopentadienyl Manganese Tricarbonyl;
(10) Nitric Acid (concentrations greater than 70 percent;
(11) Nitrogen Tetroxide;
(12) Oxygen;

(13) Phosphorus Trichloride; and
(14) (beta) Propiolactone.

Products should not be shipped under trade names; rather, the name should correspond to one of the names in the above four categories. The only exception would be a mixture consisting solely of products listed in 46 CFR subchapter D or "unregulated" products.

Among the characteristics of a particular product that are of interest when classfying it and developing minimum requirements for its carriage in bulk are:

(1) Flashpoint;
(2) Vapor pressure;
(3) Flammable limits;
(4) Auto-ignition temperature;
(5) Temperature of carriage;
(6) Boiling and freezing points;
(7) Toxicity of liquid and vapor;
(8) Reactivity with self, air, water, and materials of construction; and
(9) Corrosivity to human skin and materials of construction.

These and other physical properties of the product are evaluated to determine the requirements for safe carriage such as hull type, temperature and pressure of carriage, vent height, gauging and venting type, firefighting media, materials-of-construction restrictions, and electrical group and class. The principle used in developing requirements for the carriage of individual products is one of containment, commensurate with the hazards of the product.

A product like caustic soda (sodium hydroxide), which is highly corrosive to human skin but is nonflammable, non-toxic, has virtually no vapor pressure, and is not corrosive to mild steel, has minimum requirements allowing carriage in a single-hull vessel, open gauging and venting, no specified vent height, no special firefighting media required, and no electrical equipment requirements. Aluminum is not allowed as a material of construction due to the corrosive effect of caustic soda and the associated generation of hydrogen. On the other hand, allyl chloride is highly flammable and toxic, becomes more corrosive when wet, and has a relatively high vapor pressure. Accordingly, the requirements for its carriage specify carriage away from the vessel's hull, closed gauging and controlled venting (pressure-vacuum valves), a high vent, and special firefighting media and electrical equipment. The pressure-vacuum valve is required to be set at or above 21 kPa gauge (3 psig) to minimize the venting of cargo due to tank breathing.

The properties of these products are important not only to Commandant (G-MHM-3) but to field marine safety inspectors as well. For their own well being, it is obviously important that inspectors be aware of the properties of cargoes that are being handled while they are aboard a vessel. In addition, the knowledge of the properties of a particular cargo may influence an OCMI's time requirement for the correction of discrepancies found during routine boardings or inspections.

The inspector can usually find all the necessary information on properties of products in the *Chemical Data Guide for Bulk Shipment by Water* (CG-388) and the *Chemical Hazard Response Information System Manuals* (CG-446-1 and CG-446-2). For more information on product properties or advice on certain requirements, the Hazard Evaluation Branch, Commandant (G-MHM-3) should be contacted at FTS: 8-426-2559.

Certain chemicals, because of their potential to inflict damage to large areas and not just the immediate vicinity of the vessel, are designated "cargoes of particular hazard." These chemicals are identified in 33 CFR 124.14.

Some products, called monomers, are required to be "inhibited" to prevent polymerization during transportation. A polymerization reaction is almost always an exothermic reaction (characterized by or formed with the evolution of heat) and usually leads to the formation of a solid. Depending on the rate of reaction, the polymerization could be violent and do severe structural damage by over-pressurization, or could be very slow and result in no more serious damage than blocked or plugged lines. Unfortunately, it is not precisely known which monomers will behave in a hazardous fashion in a specific instance. The possible polymerization of a cargo must always be viewed as a potentially serious matter.

Inhibitors are other chemicals added to the monomer which help prevent its self-reaction or air oxidation. The regulations identify which cargoes need inhibitors, but do not specify the type or amount. The regulations require that the shipper furnish a certificate to the vessel identifying the inhibitor used, the amount, the duration of its effectiveness, any temperature limitations, and the action to be taken if the length of the voyage exceeds the duration of the inhibitor. See 46 CFR 153.912.

47-2-5. CHEMICAL TANKSHIPS

47-2-5A. INTRODUCTION

The modern chemical tanker is a sophisticated, small tanker (usually 20-30,000 dwt; very few, if any, over 40,000 dwt) with as many as 42 tanks. The tanks are often coated, lined, or constructed of stainless steel. These protective measures are designed to enable the carriage of cargoes that would normally attack mild steel and to insure product purity. Piping and pumping systems are more highly segregated on chemical tankships than on conventional tankships, and deep-well or submerged pumps are used in lieu of the traditional pumproom. The cargo tanks are generally smaller, since most chemical cargoes are shipped in relatively small parcels; hence, the term "parcel chemical tanks" was updated to refer to this class of ships.

The nature of the chemical trade is such that the operation of a chemical tankship is somewhat different than that of conventional oil or product tankers. Because of the small size of most cargoes, the "parcel" chemical tanker or "drugstore ship" visits many ports and sometimes several berths in each port, on each voyage. Other chemical tankers, however, are dedicated to a particular cargo and operate on a regular route.

Because of these reasons, some chemical tankers are only approved for one or two products, while others are authorized to carry over 100 different products. In general, however, chemical tankers usually carry chemicals that are flammable and similar to petroleum products in some respects, and they often carry "clean products." As a result, U.S.-flag chemical tankers are required to be certificated under 46 CFR subchapter D regulations and endorsed to carry products under 46 CFR subchapter O. The requirements in 46 CFR subchapter O supplement rather than supplant the requirements of 46 CFR subchapter D, unless specifically stated otherwise.

47-2-5B. REGULATIONS

The regulations for chemical tankships are contained in 46 CFR Part 153 (Safety Rules for Self-Propelled Vessels Carrying Hazardous Liquids). In accordance with the IMCO Bulk Chemical Code, the rules became effective for existing tankers on 12 April 1978. The only provisions of the regulations with which existing tankers are *not required* to fully comply are:

(1) Damage stability (46 CFR 153.21 and 22);
(2) Tank location (46 CFR 153.230 and 231);
(3) Accommodation space location (46 CFR 153.234); and
(4) Door location (46 CFR 153.202).

The *damage stability* requirements for existing chemical tankers are described in section 47-1-10B of this chapter of the manual. The *tank location* requirements are relaxed for existing tankers, except that the distance between a Type II containment system and the bottom may not be less than 76cm (30 inches). These two considerations shall be handled by district commanders (mmt) in consultation with Commandant (G-MHM) and are of little concern to marine safety field inspectors. However, the relaxations noted in (3) and (4) above *are* of much more concern to the inspector. The regulations presently do not describe specifics with which an existing tanker is expected to comply, as far as an existing midship accommodation house is concerned. In addition, it has been found impractical to demand compliance with the door location requirements in 46 CFR 153.202 on existing ships. The Coast Guard and other national administrations at IMCO have agreed to guidelines for the treatment of midship houses and doors on existing ships. These guidelines are covered under the explanations of paragraphs 46 CFR 153.7(c)(3), (4), and (5) which are contained in the following section of this manual.

As with any new set of regulations, there are several areas of the regulations in 46 CFR part 153 that have had to be modified, interpreted, or clarified, since problems in their application were encountered. The guidelines in section 47-2-5C which follows were developed to insure uniformity in the interpretation and application of the regulations in 46 CFR part 153.

Other problems of a technical nature that are encountered when applying these regulations should be brought to the attention of Commandant (G-MHM-1).

47-2-5C. INTERPRETATION AND APPLICATION OF 46 CFR PART 153

The following information applies to specific sections, subsections, and paragraphs of the Federal regulations in 46 CFR Part 153 (Safety Rules for Self-Propelled Vessels Carrying Hazardous Liquids):

- Section 153.1 — Applicability. Inquiries have been made concerning the application of the regulations in 46 CFR part 153 to a tank vessel that will carry cargoes regulated under part 153 only, in a limited area of the cargo containment/tank section of the vessel. The view is that 46 CFR part 153 would not apply to areas of the cargo containment/tank section if 46 CFR part 153 cargoes were not carried in these areas. The logical extension is to treat individual tanks and piping systems as separate zones, subject to either 46 CFR part 153 or 46 CFR Parts 30–40 (Subchapter D—Tank Vessels).

This approach to the application of the requirements in 46 CFR part 153 was, however, never intended by the Commandant. The standards in 46 CFR part 153 for areas such as fire protection, ballast piping and equipment, electrical equipment, personnel safety, operational requirements, etc., shall be applied for the *entire* cargo-containment section of the vessel, even though the carriage of cargoes regulated by 46 CFR part 153 is restricted to only a few cargo tanks. An individual containment system (i.e., cargo tanks, piping, vent lines, and gauging equipment) would not be subject to 46 CFR part 153, provided the system will not be used for 46 CFR part 153 cargoes.

- Paragraphs 153.7(c)(3), (4), and (5) — Standards for Midship Houses and After Deckhouses on Existing Vessels. Paragraphs 153.7(c)(3), (4), and (5) outline requirements and allowances for existing vessels. Under 153.7(c)(3), (4), and (5), allowances have been made for existing vessels not meeting section 153.234 (i.e., vessels that have midship houses). Additionally, vessels with midship houses often cannot comply with Sections 153.200 and 153.202 (General Vessel Arrangements).

The IMCO Chemical Code also has made allowances for existing vessels with midship houses but has not specified how such vessels will be treated. The U.S. presented a paper to IMCO proposing a uniform interpretation of the Code on this particular topic. IMCO agreed to the need for uniform guidelines and, in turn, approved the U.S. interpretation. Consequently, existing chemical tankers constructed with an accommodation space (i.e., midship house) located within the boundaries of the cargo area may continue to operate with such an arrangement. When flammable and/or toxic cargoes (cargoes for which sections 153.515 and 153.526 of the regulations are given as special requirements in table 1 of 46 CFR part 153) are permitted for carriage in the cargo tanks below the midship house, the following standards shall be enforced:

(1) Accommodations are not allowed in the space bounded by the cargo tanktops and the first deck of the midship house (referred to as the "bridge space").

(2) Cargo tanktops forming the boundary of the bridge space shall be free of any thru-deck penetrations. Cargo tank hatches, Butterworth openings, deepwell pumps, ullage openings, sounding tubes, and any other such penetrations in the cargo tanktops shall not be permitted in this space.

(3) Electrical cables, pipe runs, and other penetrations in the first deck of the midship house immediately above the cargo tanktops are allowed, provided these penetrations are made gastight. Doors, hatches, and other access openings in this deck of the midship house are not permitted.

(4) When the bridge space is bounded by a bulkhead at either side at the fore and aft end, the ventilation requirements of sections 153.312 and 153.467 of the regulations must be met. The increased ventilation rate prescribed in section 153.316 does not apply to the bridge space, regardless of the cargo carried.

(5) Electrical installations within the bridge space shall meet the requirements of section 153.466 of the regulations.

(6) Other than for approved connections to shutoff valves and expansion joints, runs of fixed cargo piping with nonwelded joints shall not be permitted in the bridge space.

For existing vessels which are unable to meet the requirements of sections 153.200 and 153.202, the following measures are considered to provide an equivalent standard of safety and are acceptable in accordance with section 153.10. These measures shall apply for the carriage of any cargo listed in table 1 of 46 CFR part 153 and in any cargo tank on the vessel:

(1) Portlights located on the forward bulkhead of the aft deckhouse accommodation and on the midship house bulkheads facing the cargo area, except for wheelhouse windows, shall be fixed (i.e., incapable of being opened) and gastight. Wheelhouse windows shall meet the requirements contained in 46 CFR 153.200. Doors located on the forward bulkhead of the aft deckhouse accommodation that lead out onto the cargo tank deck shall be *permanently* sealed shut. Where existing arrangements preclude this, a suitable airlock arrangement at the present door location shall be provided. This airlock, when fitted, shall include a gastight, self-closing, metal, outer door and a substantially gastight, self-closing, inner door. The inner door shall be at least a metal joiner door. The airlock space between the doors shall be mechanically ventilated from a nonhazardous location and maintained at an overpressure to the space outside the airlock. An audible and visual alarm system to give warning on both sides of the airlock shall be provided to indicate if more than one door is moved from the closed position.

(2) Portlights located on the side of the after deckhouse must also be fixed and gastight if they are located:

(a) On or above the first deck (tier) above the cargo deck; and

(b) Within 10 feet of the forward bulkhead *or* within that distance aft of the forward bulkhead to the first side door (whichever is less).

(3) Doors located more than 2.4 meters above the cargo tank deck and facing the cargo tank area shall be substantially gastight and self-closing. This provision applies to doors on the aft deckhouse accommodation as well as the midship house. (The Commandant has determined that solid metal or wooden joiner doors, except those having screens or louvers, will fulfill this requirement of "substantially gastight.")

(4) Accommodations are not allowed in the bridge space. Accordingly, doors leading out onto the cargo tank deck from the bridge space of the midship house are exempt from the above requirements.

Some existing chemical tankers have been constructed in such a manner that the after accommodation spaces partially extend over a cargo pumproom which forms the after end of the cargo tank area. If such a pumproom services tanks which may be carrying any cargo regulated under 46 CFR part 153, the chemical tanker may continue to operate with such an arrangement *provided* that the ventilation requirements of sections 153.312 and 153.316 are met for the pumproom. The pumproom ventilation system must be in operation:

(1) During all phases of cargo handling and transfer;
(2) During tank cleaning and gas-freeing; and
(3) Whenever work involving equipment within the pumproom is undertaken.

- Paragraphs 153.7(c)(3), (4), and (5) — Damage Stability Requirements for Existing Vessels. Additionally, paragraphs 153.7(c)(3) and (5) of the regulations permit the endorsement of a cargo-containment system as either a Type II or Type III system if the vessel has a Loadline Certificate and meets any additional requirements listed. The IMCO Chemical Code does not require existing vessels to meet the damage stability requirements of the Chemical Code. Since the regulations in 46 CFR part 153 were developed from the Chemical Code, paragraphs 153.7(c)(3) and (5) provide a similar waiver for existing vessels. Accordingly, under 153.7(c)(3) and (5), existing vessels are not required to meet the damage stability standards given in 153.21, 153.22, and 153.231(b). Sections 153.30, 153.31, 153.32, and 153.34 are also concerned with damage stability and do not pertain to existing vessels.

Under paragraphs 153.7(c)(3) and (5), an existing vessel may have its cargo-containment systems endorsed as either Type II or Type III, provided the vessel has a valid Loadline Certificate. Additionally, paragraph 153.7(c)(3) imposes tank shell separation requirements for the endorsement of Type II systems. A valid Loadline Certificate does not guarantee that an existing vessel meets any particular damage stability standard nor that damage stability calculations were ever done. Consequently, the requirement for the Loadline Certificate under paragraphs 153.7(c)(3) and (5) should be viewed in this context.

Paragraph 153.7(c)(4) stipulates that existing vessels undergoing conversions by adding double bottoms or wing tanks for upgrading to a Type II containment system must meet the damage standards of sections 153.32 and 153.34 in all areas of the vessel, except for the machinery spaces. Damage stability calculations are required for modifications of this nature or any other structural modifications.

See also the remarks below for section 153.12 of the regulations regarding damage stability requirements for U.S.-flag vessels obtaining IMCO Certificates of Fitness.

- Section 153.12 — IMCO Certificates. A vessel which meets the definition of an existing vessel under 153.7(a)(2) and whose keel was laid after 12 April 1972 is considered a new vessel under section 1.7.2 of the IMCO Chemical Code. If the owner of a vessel in this category applies for an IMCO Chemical Code Certificate of Fitness, the vessel is required to meet the requirements of 46 CFR part 153 for Type I, II, and III hulls.

- Sections 153.21, 22, 30, 31, 32 and 34 — Hull Type Calculations. See the remarks for paragraphs 153.7(c)(3), (4), and (5) above concerning standards for midship houses and after deckhouses on existing vessels.

- Sections 153.200 and 153.202 — General Vessel Arrangements. See the remarks for paragraphs 153.7(c)(3), (4), and (5) above concerning standards for midship houses and after deckhouses on existing vessels.

• Section 153.214 — Personnel Emergency and Safety Equipment.

(1) Subsection 153.214(a). Under section 3.16.9 of the IMCO Chemical Code, only one stretcher is required. See the remarks for section 153.808 below.

(2) Subsection 153.214(c). Neither the U.S. Mining Safety and Health Administration (formerly the Mining Enforcement and Safety Administration) nor the National Institute for Occupational Safety and Health (NIOSH) presently approve first aid kits. Until standards are available for evaluating first aid kits, any first aid equipment will be sufficient to meet this requirement.

• Section 153.217 — Access to Void Spaces. See the remarks for section 153.254 below.

• Subsection 153.231(b) — Type II Containment System. See the remarks for paragraphs 153.7(c)(3), (4), and (5) above concerning the damage stability requirements for existing vessels.

• Section 153.234 — Fore and Aft Location. See the remarks for paragraphs 153.7(c)(3), (4), and (5) above concerning standards for midship houses and after deckhouses on existing vessels.

• Section 153.254—Cargo Tank Access. Different criteria apparently have been applied in a few cases when differentiating between an access opening and an access trunk to a cargo tank or void space. For example, access openings to void spaces and cargo tanks having 24-inch high coamings are not considered to be access trunks by 46 CFR 153.254(d). Access trunks are sized larger to account for internal projections such as side-mounted ladders that decrease the effective cross-sectional area of the opening. Whether or not an access opening to a cargo tank or void space is considered as an access trunk will depend upon the placement of mounted ladders and the resultant cross-sectional area. Horizontal access openings (such as hatches and manholes) must be of sufficient size to allow a person wearing a breathing apparatus to ascend or descend any ladder without obstruction. Minor relaxations of these standards will be permitted for existing vessels if it can be shown that the existing horizontal access openings will allow a person with a breathing apparatus to enter or leave a space without obstruction as described above.

Enlarging an access opening to the dimensions required under 46 CFR 153.254 might impair the structural integrity of the tank or space. The intent of this section of the regulations will be met if such an access opening is enlarged as much as possible without impairing the structural integrity of the space.

• Section 153.280 — Piping System Design. As set forth in 46 CFR 56.10–5(d), the use of plastic pipe and fiberglass reinforced plastic (FRP) pipe, such as "Bonstrand", for service with flammable or combustible cargoes is prohibited. Acceptable materials and specifications for piping systems are given in 46 CFR 56.60.

Recognizing the need on parcel tankers to load relatively small quantities of hazardous cargoes without using the usual manifold or pumproom arrangements, direct loading with portable piping and hoses is considered to provide a suitable alternative. When loading larger quantities (i.e., one cargo being loaded into more than two tanks), fixed piping is required.

"Direct loading" through a fixed drop line or deep-well pump stack from a portable piping system must comply with the following:

(1) All connections between hoses, pipes, fixed drop lines, and deep-well pumps are to be made in accordance with 33 CFR 156.130. Any connection between hose or pipe sections, which have the reduced portable containment permitted below, must have a tightened bolt in each hole of the flange to secure the connections.

(2) After disconnection, pipes and hoses are to be drained and cleaned before removal from the containment area.

(3) Not more than one "Y" piece is to be used for each cargo being loaded, i.e., not more than two tanks may be loaded with any one cargo using this method.

(4) Hoses shall be in accordance with 33 CFR 154.500 or 46 CFR 153.940, as applicable to the cargo being transferred. A portable hose line may not consist of more than four sections, nor may it exceed 100 feet in length.

(5) Portable pipes must be constructed of materials in accordance with the requirements of 46 CFR part 56.

(6) When loading or discharging a cargo which is required by 46 CFR part 153 to have closed or restricted gauging, the fixed drop line or deep-well pump connection must have a stop valve. After transfer, the valve should be left in place, closed, and blanked.

- Section 153.282 — Cargo Filling Lines. The cargo tank filling lines on existing vessels that terminate near the bottom of the tank will meet the intent of this provision and do not warrant modification.

- Section 153.296 — Emergency Shutdown Stations. Subsection 153.296(a) requires two emergency shutdown stations; whereas section 2.11.1 of the IMCO Chemical Code only requires that remote shutdown devices be installed for all cargo pumps and similar equipment. See the remarks for section 153.808 below.

- Sections 153.312 and 316 — Ventilation Standards and Rates. See the remarks for paragraphs 153.7(c)(3), (4), and (5) above concerning the standards for midship houses and after deckhouses on existing vessels.

- Section 153.332 — Hoisting Arrangement. The IMCO Chemical Code does not specify a minimum lifting capacity for the pumproom hoisting arrangement. Specifications prescribed by the flag administration are acceptable for foreign vessels possessing IMCO Chemical Code certificates. See the remarks for section 153.808 below.

- Paragraph 153.334(b)(2) — Bilge Pumping Systems. The IMCO Chemical Code does not require a bilge alarm in cargo pumprooms. See the remarks for section 153.808 below.

- Section 153.352 — Venting System Outlets. This provision does not refer to flame screens. Additionally, the IMCO Chemical Code does not contain specifications for the mesh size of flame screens. Whenever foreign-flag vessels carry flammable or combustible cargoes, flame screens must be installed in accordance with 46 CFR 30.10–25, 32.55–20, and 35.30–10.

- Section 153.358 — Venting System Flow Capacity. Section 2.13.2 of the IMCO Chemical Code has been revised to include the standards of 46 CFR 153.358. The pressure differential specified in the Code, however, is 20 kPa gauge (2.9 psig) in lieu of 28 kPa gauge (4.06 psig). (The unit kPa (kilopascal) equals 0.145 psi. See appendix III to 46 CFR part 153.) An IMCO certificate is sufficient documentation that a foreign vessel meets the requirements of this section of the regulations.

- Section 153.360 — Venting System Restriction. Rupture discs may be used in series with pressure-vacuum (PV) valves.

- Section 153.366 — Spill Valves. Containers for spill valves are not required under the Chemical Code; however, foreign IMCO vessels are required to comply with subsection 153.366(a), and U.S.-flag vessels are also required to comply with 153.366(a). See the remarks for section 153.808 below.

- Section 153.404 — Required Closed Gauges. Many foreign- and U.S.-flag chemical vessels utilize float-type closed gauging devices as portable gauging equipment. Portable closed gauging is considered acceptable in lieu of a permanent installation, provided the gauge manufacturer's installation and operating instructions are followed. Some float-type gauges require the installation of guide wires to insure proper operation. Other float-type gauges have been designed such that guide wires are not essential; consequently, in many instances, guide wires are not utilized. The manufacturer's installation and operating manual shall be on board vessels equipped with these gauges. If a question arises over the need for guide wires, inspectors should consult the manufacturer's instructions for guidance. Documentation from the manufacturer is required confirming that gauges can be used without guide wires.

Subsection 153.404(d) contains specifications for cargo-sampling systems. A means of cargo sampling is not required by 153.404(d); however, if a sampling system is installed, it shall meet the specifications of 153.404(d).

- Section 153.430 — Heat Transfer System. Foreign IMCO vessels shall comply with the rules and standards of their classification societies and/or flag administrations. See the remarks for section 153.808 below.

- Section 153.436 — Heat Transfer Fluid. The purpose of this requirement is to insure that the heating medium and the cargo are compatible. Foreign IMCO vessels shall comply with the IMCO Chemical Code which is equivalent to this section of the regulations (i.e., IMCO section 2.15.2).

- Section 153.438 — Cargo Pressure or Temperature Alarms. All vessels, foreign and U.S., are required to satisfy either paragraph 153.438(a)(1) or (2). (Note: Section 2.15.5 of the IMCO Chemical Code refers only to a temperature-measuring system.) All vessels, foreign and U.S., are also required to comply with subsection 153.438(b) of the regulations. (Note: This requirement exceeds section 2.15.5 of the IMCO Chemical Code which does not require an alarm on the bridge.)

The temperature- and pressure-sensing arrangements required by this section of the regulations must be independent of other temperature/pressure-sensing arrangements in accordance with subsection 153.438(c). This subsection also applies to all foreign and U.S. vessels. It should also be noted that 46 CFR part 153 requires alarms only for cooling systems; whereas IMCO requires alarms if overcooling *or* overheating could result in a dangerous condition. See the remarks for section 153.808 below.

- Section 153.440 — Cargo Temperature Sensors. The term "elevated temperature cargo" is not defined in 46 CFR part 153. Questions as to whether a particular cargo is considered an "elevated temperature cargo" are being evaluated by the Commandant, and any such questions should be referred to Commandant (G-MHM).

If a cargo is carried at elevated temperatures, the requirements of subsection 153.440(a) apply for all foreign- and U.S.-flag vessels. Thermometers lowered through open hatches are permitted by 46 CFR part 153 for any open-gauged cargo. Such arrangements fall within the definition of "remote reading." See the remarks for section 153.808 below.

- Sections 153.466 and 467 — Electrical Equipment and Ventilation Systems. See the remarks for paragraphs 153.7(c)(3), (4), and (5) above concerning the standards for midship and after deckhouses on existing vessels.

- Section 153.500 — Inert Gas Systems. This section of the regulations is equivalent to section 2.19.3 of the IMCO Chemical Code with regard to inert gas generation. See the remarks for section 153.808 below.

- Section 153.525 — Special Requirements for Unusually Toxic Cargoes.

(1) Subsection 153.525(c). There are major differences between this requirement and the IMCO Chemical Code. The Code does not require pumps and valves for unusually toxic cargoes to be operable

from the weather deck. Sections 2.10.4 and 4.13.3 of the Code address the standards for pumps and valves but do not impose a standard equivalent to 153.525(c). See the remarks for section 153.808 below.

(2) Subsection 153.525(d). This requirement corresponds to section 2.15.6 of the IMCO Chemical Code. The intent of this requirement is to minimize the possibility that other systems (e.g., potable water, feed water, cargo, fuel, etc.) will be contaminated by toxic cargoes. The most common heating system found on existing ships utilizes low-pressure steam produced by either main propulsion boilers or cargo-heating boilers located in the engine room. Condensate drains from the cargo tank heating coils are returned to the feedwater system by an inspection tank. Paragraph 2.15.6(c) of the Chemical Code provides for this type of heating system.

Although systems meeting paragraph 153.525(d)(1) or (2) (or 2.15.6(a) or (b) of the IMCO Code) are preferable, steam heating systems are acceptable, provided certain measures are taken. The steam heating system previously described is acceptable, provided the heating coil drains return to an inspection tank which is located on deck and within the cargo-containment area. The inspection tank must be fitted with a drain valve to facilitate the sampling of returns for cargoes that cannot be detected by normal visual means. Cargoes that are clear and soluble in water would be difficult to detect visually. In these instances, the sample taken would then be analyzed for the presence of cargo.

If a vessel owner elects this or a similar system, it is his responsibility to demonstrate that the necessary safeguards have been incorporated in the design.

• Section 153.526 — Toxic Vapor Detectors. Vapor-detection equipment may be unavailable for some of the cargoes for which this section of the regulations applies. If the required equipment is unavailable for a particular toxic cargo, the following criteria shall be applied:

(1) If a vessel carries the toxic cargo in a tank that *is* piped through a pumproom, the vessel shall meet paragraph 3.16.6(b) of the IMCO Chemical Code. Paragraph 3.16.6(b) requires a vessel to have either:

(a) A low-pressure line system from fixed air bottles to the pumproom and with hose connections suitable for use with the breathing apparatus required by paragraph 153.214(b)(1) of the regulations. This system must have sufficient capacity to enable two men to work in a gas-dangerous space for at least one hour each, without using the cylinders of the breathing apparatus. Means shall be provided for recharging the fixed air bottles from a special air compressor; or

(b) An equivalent quantity of spare bottled air which shall be provided by additional cylinders for the breathing apparatus.

(2) A vessel that carries a toxic cargo in tanks that *are not* piped through a pumproom (i.e., tanks with in-tank pumps) are not required to be equipped with the additional equipment described in (a) or (b) above.

(See also the related remarks for subsection 153.934(b) below.)

Questions concerning the commercial availability of toxic vapor detectors for specific products should be referred to Commandant (G-MHM-1).

• Section 153.527 — Toxic Vapor Protection. The "Special Requirements" column of table 1 of 46 CFR 153 does not refer to this section because, at the time of publication, IMCO had not designated the products for which this provision would apply. A list of products to which the equivalent section of the Code (i.e., section 3.16.10) would apply was agreed to at the fourth session of the IMCO Subcommittee on Bulk Chemicals (BCH IV). The following products are subject to this section:

Acetic acid
Acetic anhydride

Acetone cyanohydrin
Acrylonitrile
Allyl alcohol
Allyl chloride
Ammonium hydroxide (28 pct or less NH)
Benzyl chloride
(iso-, n-, sec-, tert-) Butylamine
Carbon disulfide
Carbon tetrachloride
Chlorform
Chloroprene
Chlorosulfonic acid
Crotonaldehyde
1, 1-Dichloroethane
1, 3-Dichloropropene
Diethylamine
Diisopropylamine
Dimethylamine (40 pct or less)
Epichlorohydrin
Ethyl acrylate
Ethylene chlorohydrin
Ethylene dibromide
Ethyl ether
Formaldehyde solution (37 to 50 pct)
Formic acid
Hydrochloric acid
Methyl acrylate
Motor fuel anti-knock compounds (containing lead alkyls)
Nitric acid (70 pct or less)
Oleum
Propionic acid
(iso-, n-) Propylamine
Toluene diisocyanate
Triethylamine
Vinylidene chloride
Vinyl ethyl ether

- Subsection 153.530(p) — Special Requirements for Alkylene Oxides. Water-spray requirements for propylene oxide are found in section 4.7.21 of the IMCO Chemical Code. Under section 153.530(p) of the regulations, the water-spray system must operate automatically. Section 4.7.21 of the Chemical Code does not require automatic operation of the water-spray system. All vessels, foreign and U.S., which will handle alkylene oxides, must comply with subsection 153.530(p). See the remarks for section 153.808 below.

- Subsection 153.554(c). Litmus paper or other similar indicators are acceptable for satisfying the requirements of this subsection of the regulations.

- Subsection 153.555(b). This provision is equivalent to section 4.8.5 of the IMCO Chemical Code. Under 153.555(b) and 4.8.5, electrical equipment and lighting is not permitted in a cargo pumproom which is adjacent to acid tanks. Requirements for electrical equipment in pumprooms which handle inorganic acids is currently under review by IMCO.

- Section 153.806 — Stability Test and Information. The requirements under 153.806(b) are equivalent to those of section 2.2.1 of the IMCO Chemical Code. All vessels, foreign and U.S., are required to comply with paragraph 153.806(b)(1) of the regulations. Existing vessels which are exempt from meeting damage stability standards need not comply with paragraph 153.806(b)(2). See the following remarks for section 153.808.

- Section 153.808 — Examination for an LOC. Foreign IMCO vessels shall be examined under the provisions of the IMCO Chemical Code until differences between 46 CFR part 153 and the Code have been resolved through IMCO. There may be certain requirements of 46 CFR part 153 which exceed those of the Code and which will be enforced on foreign IMCO vessels. These requirements will be indicated as necessary.

For areas where the Code is vague or not specific, the regulations in 46 CFR part 153 shall be used as guidance to determine if the vessel meets the intent of the Code. If the intent of the Code has been met, the arrangement can be accepted. Any questions concerning shipboard arrangements that cannot be resolved locally should be referred to Commandant (G-MHM).

- Subsection 153.900(a) — Certificate Endorsements. Before a U.S.-flag vessel is permitted to carry a cargo listed in table 1 of 46 CFR 153, the vessel must have either a Certificate of Inspection (Form CG-841) or a Certificate of Inspection Amendment (Form CG-858) specifically endorsed for each cargo. The endorsement on either form shall list each cargo by name and the cargo tank(s) in which carriage is permitted. Vessel hull-type classification must also be shown on the form. In the box marked "class," the following entry shall be made:

"TANKSHIP/HULL TYPE *(I, II, or III, (as appropriate))*."

For U.S.-flag vessels that have been granted extensions under paragraph 153.7(c)(6), the Certificate of Inspection and/or Inspection Amendment shall also be endorsed as follows:

"Those cargoes which are listed on this certificate and which are also included in table 1 of 46 CFR 153 are authorized for carriage until (*enter date that extension expires*)."

When the vessel is upgraded to comply with 46 CFR part 153, an amendment to the Certificate of Inspection can be issued invalidating this endorsement.

In order to verify that an extension has been granted, the vessel owner shall be able to produce the letter from Commandant (G-MHM) granting the extension.

- Section 153.907 — Cargo Information Cards. Possible sources for cargo information cards include the Manufacturing Chemists' Association and the shipper or manufacturer of the chemical.

- Section 153.933 — Protective Clothing Required. This requirement applies only to persons on the vessel forward of the after deckhouse and engaged in one of the jobs listed in section 153.933. Therefore, this requirement would apply to terminal employees and shipboard personnel on board the vessel and engaged in any of those tasks mentioned in 153.933.

- Subsection 153.934(b) — Entry Into Spaces. This subsection requires the master to insure that personnel wear protective equipment with a self-contained breathing apparatus if they enter cargo tanks, cargo handling spaces (i.e., pumprooms), or void spaces which are not free of toxic vapors or which do not have sufficient oxygen to support life. Subsection 153.934(b) applies to any cargo listed in table 1 of 46 CFR part 153, not just those cargoes requiring vapor-detection equipment under section 153.526.

- Section 153.940 — Standards for Marking of Cargo Hose. The requirements of this section for cargo hoses apply only to hoses used in transferring one of the cargoes in table 1 of 46 CFR 153 to or from a tankship. This would also include any terminal hoses that would be involved in the transfer of table 1 cargoes to or from the tankship.

(See also the related remarks regarding portable piping and hoses for section 153.280 above.)

- Section 153.972 — Connecting a Cargo Hose. This provision requires the person in charge of cargo transfer to use a hose that meets section 153.940 requirements. See the remarks for section 153.940 above.

- Section 153.1020 — Unusually Toxic Cargoes. See the remarks for subsection 153.525(d) above.

47–2–10. CHEMICAL BARGES

The regulations for chemical barges are found in 46 CFR Part 151 (Unmanned Barges Carrying Certain Bulk Dangerous Cargoes) and were made effective on 1 June 1970. They required upgrading of existing barges, except those previously certificated under 46 CFR parts 36, 38, 39, 40, and 98. Operating requirements in 46 CFR part 151 apply to barges of any age. The regulations follow the same philosophy as those for ships — containment of the cargo to a degree commensurate with the hazards of the product.

Chemical barges carrying products which are flammable or combustible are required to be certificated under 46 CFR Parts 30–40 (Subchapter D — Tank Vessels). Barges carrying only nonflammable products can be certificated under either 46 CFR Subchapter D (Tank Vessels) or I (Cargo and Miscellaneous Vessels) at the owner's option. If the owner does not indicate his choice of options, the barge shall be certificated under 46 CFR subchapter D. The certificate is then endorsed for the carriage of specific cargoes under 46 CFR part 151. See part 48–2 of this manual for a further explanation of certification procedures.

The rules for barges follow the same general format as those for ships; i.e., general requirements for all chemical barges and a table of minimum and special requirements for individual products.

Since the adoption of 46 CFR part 151, there have been very few amendments. In particular, the lists of cargoes in 46 CFR tables 151.01–10(b) and 151.05 have not been kept current. There are many additional cargoes which have been authorized for carriage on chemical barges. Tentative minimum requirements are established for such cargoes, and the shipper and all district commanders (m) are notified of these by letter.

Since the initial promulgation of 46 CFR part 151, some problem areas in interpretation or application have arisen. Because of the need to clarify these points, to add all the cargoes approved since 1970, and to specifically address manned barges, a regulatory project is underway by the Commandant to revise 46 CFR part 151. In the interim, questions involving manned barges or other areas open to interpretation in 46 CFR part 151 should be referred to Commandant (G-MVI-1), telephone FTS: 8–426–2183. Questions regarding minimum requirements for cargoes which are not listed in 46 CFR table 151.05 should be referred to Commandant (G-MHM-3) at FTS: 8–426–2559.

An index to the regulations in 46 CFR part 151 is contained in Navigation and Vessel Inspection Circular (NVC) 5–71.

47–2–15. COMPATIBILITY GUIDE

A Guide to the Compatibility of Chemicals for Bulk Liquid Cargoes is contained in Navigation and Vessel Inspection Circular (NVC) 4–75. This NVC is considered self-explanatory and its use need not be further discussed. However, it is important to note that exceptions to the Guide are granted by Commandant (G-MHM-3) from time to time, based on experimental data supplied to support the request for exception. Enclosure (3) to NVC 4–75 describes the test procedure to be used by a shipper or manufacturer in developing such data. If an exception has been granted, the shipper must produce written verification from Commandant (G-MHM-3). If he is unable to do so, his claim shall be verified by calling Commandant (G-MHM-3), FTS: 8–426–1019.

A vessel's Certificate of Inspection carries an endorsement stating that "cargoes which react in a hazardous manner must be separated." A foreign vessel's Letter of Compliance requires stowage in accordance with the latest Compatibility Guide. It is anticipated that the Compatibility Guide will be incorporated into the regulations in 46 CFR Subchapter O (Certain Bulk Dangerous Cargoes) so that questions as to its enforceability will be resolved.

While it is very difficult to ascertain that incompatible cargoes are not linked through common below-deck piping without having plans of the vessel, an effort shall be made to insure correct stowage on chemical tankers, as far as practicable. Cargo piping which carries incompatible cargoes shall be made separate by the removal of spool pieces or valves and the installation of blank flanges. Other methods, such as "Seutelven" flanges (arranged so that the cover cannot be in place when in use) or two spectacle flanges with a drain between them, have been accepted as equivalent. The approach is to have a positive means of verifying that separation is effected and that leakage would be detected.

Some foreign administrations have their own compatibility guides; others allow compliance with NVC 4–75 and the approved means of separation described above on Letter of Compliance vessels.

MARINE SAFETY MANUAL (CG-495)

PART 47-3—BULK LIQUEFIED GASES

47-3-1. INTRODUCTION

Like bulk liquid chemicals, bulk liquefied gases are evaluated on their particular properties. The same procedures for evaluating new products and establishing minimum requirements as outlined in section 47-2-1B of this manual are used. Most gases, though, are considered hazardous because of the temperature and pressure at which they are carried. Liquid nitrogen, for example, is inert, nontoxic, and noncorrosive, but can be hazardous due to its very low temperature of carriage.

Gases have most of the same properties as liquid chemicals. Some gases such as the alkanes (methane, ethane, propane, etc.) have flammability as their primary hazard. Others are nonflammable but highly toxic, e.g., chlorine and sulfur dioxide. Still others are corrosive, capable of polymerization, unstable, or incompatible with common materials of construction.

Some combinations of liquefied gases are incompatible (see subpart 47-2-15 of this manual), and others require inhibition similar to liquid chemicals (see section 47-2-1B). Most of the gases carried in bulk are designated "cargoes of particular hazard" in 33 CFR 124.14 because of their potential ability to cause damage over large areas.

When gases are carried in bulk, they are liquefied by compression, refrigeration, or both. Thus, they are carried in what may be described as an "unnatural" state and thus possess large amounts of stored energy. In order to contain them during carriage, the pressure or temperature must be maintained. Under Coast Guard regulations, a cargo tank for gases must be able to withstand the vapor pressure of the cargo at 45°C or have reliquefaction equipment. The only exceptions to this rule are LNG (methane) and nitrogen. (Nitrogen is not currently being carried as a *cargo*, only for use as inert gas). Methane cannot be liquefied by pressure alone at temperatures above -116°F. Reliquefaction is not currently practical on ships, since very large refrigeration machinery is required. The boil-off vapors from LNG are burned in the ship's boilers in order to control temperature and pressure without venting.

The breakpoint between liquids and gases for purposes of the regulations is somewhat arbitrary. In the past, the breakpoint has been a Reid vapor pressure (RVP) of 40 psia (i.e., vapor pressure of 40 psia at 100°F). However, when IMCO developed the Gas Code, certain products with RVP below 40 were included. The new Coast Guard regulations for gas ships use an RVP of 25 psia. This figure includes the products that IMCO has included in its Gas Code. Some high vapor pressure liquids such as propylene oxide, isoprene, and propylamine are often carried in gas ships because of the need to refrigerate them or contain pressure buildup.

Much public attention has been centered on one particular liquefied gas cargo — LNG. In response to repeated inquiries about LNG, the Coast Guard has distributed a publication entitled *Liquefied Natural Gas, Views and Practices, Policy and Safety* (CG-478). In addition, ports which handle LNG ships have published contingency plans. While all this attention to LNG is justified, it should be remembered that most of the other liquefied gases are just as dangerous as LNG, and some even more so.

47-3-5. NEW GAS SHIPS

New gas ships are defined under the IMCO Gas Code and the U.S. regulations in 46 CFR part 154 as ships with a building contract let after 31 October 1976 or a keel laid after 31 December 1976 or delivered after 30 June 1980. Any ship, regardless of its age, that meets the standards of the IMCO Gas Code, is also defined as a "new" ship. When a ship is converted, it is treated as a new ship.

The major difference between a gas ship and an ordinary tanker is the cargo-containment system.

There have been many articles written about the containment systems in use (mostly about LNG tanks), so there is no need to elaborate on this subject in detail in this manual. Briefly, there are six types of tanks used on gas carriers:

(1) Integral gravity tanks. These are similar to conventional tanks on ordinary tankers. They cannot be used for cargoes carried below −10°C and are generally not approved for pressures above 4 psig. As a result of these restrictions, these types of tanks are not normally encountered on gas ships.

(2) Membrane tanks. As the name implies, these are very thin-walled tanks, they are not self-supporting, and they must have a full secondary barrier. The secondary barrier is essentially another tank surrounding the primary barrier. The primary and secondary barriers and the insulation are all supported by the inner hull of the vessel. The tanks are capable of withstanding only very low pressures, both internally and externally. Membranes are used primarily for LNG.

(3) Semi-membranes. These are similar to membrane tanks except that they are self-supporting when empty and therefore may be built outside the ship and lowered therein. They have not received wide application.

(4) Independent tanks. There are three types of independent tanks. These are self-supporting tanks that can be built outside the ship and are not affected by normal hull stresses:

(a) Type A. These are prismatic-shaped tanks with internal or external stiffeners. They are required to have secondary barriers. This type of tank is very common on gas ships of all types.

(b) Type B. These tanks are very much like pressure vessels except that the weight of the cargo rather than the vapor pressure of the cargo is the predominant design parameter. Thus, they do not fully meet the design criteria for pressure vessels. They are, however, bodies of revolution and are easier to analyze then type A tanks. Because of this, they are required only to have a partial secondary barrier. The primary example of this type is the large spherical tanks in LNG ships. The secondary barrier is essentially an extremely large drip pan. The tanks are capable of withstanding about 30 psig.

(c) Type C. These are true pressure vessels. These tanks are very common in liquefied gas ships other then LNG ships. They may or may not be refrigerated and insulated. No secondary barrier is required.

All tank types, except type C, are heavily instrumented with gas detection equipment (in the hold and interbarrier spaces), temperature sensors, and pressure gauges. Tanks other than types B and C must be in inerted holds if the cargo is flammable. Hold spaces for type B tanks may be filled with air, but the ship must have the capability to rapidly inert the hold space if a leak were detected.

Tank types B and C must be designed with a factor of safety of 4 to 1. The IMCO Gas Code, on the other hand, requires only 3 to 1, but makes provisions for the U.S. standard by listing the allowable stress factors on the Certificate of Fitness. U.S.-flag ships and foreign-flag ships applying for a Letter of Compliance (LOC) must meet the U.S. standard.

The Coast Guard also requires the use of lower ambient design temperatures than the IMCO Gas Code. The temperatures used during the design must also be shown on the IMCO Certificate of Fitness. Again, foreign-flag ships will not be issued an LOC if they have not met the U.S. standard.

A third area in which the regulations in 46 CFR part 154 exceed the IMCO Gas Code is the requirement for enhanced grades of steel for crack-arresting purposes at the sheer strake, deck stringer, and bilge strake. The rules of many classification societies permit the construction of 165,000 cu.m. LNG ships with the entire outer shell made of Grade A steel. No strakes of material having enhanced notch-toughness properties to act as conventional crack arrestors are required. Because this is felt to be an undesirable engineering practice, and that the possibility exists for crack initiation due to a spill of cryogenic liquid, the Coast Guard requires grades of steel with enhanced crack-arresting properties in the sheer strake, the deck stringer, and the turn of the bilge. This requirement must also be met for LOC gas ships, but there is no indication of this on the Certificate of Fitness. Commandant (G-MHM-1) verifies that crack-arresting steel has been used before issuing the LOC, based on classification society certification.

As explained in section 47-1-10C of this manual, Coast Guard regulations do not permit the option given in the IMCO Gas Code of controlling cargo temperature and pressure by venting.

Other than operating requirements and the four areas described above, the regulations in 46 CFR part 154 follow the IMCO Gas Code as closely as possible. In fact, the sections of the regulations were numbered to correspond to the chapters of the Code; e.g., the section of regulations numbered 153.900 corresponds to chapter IX of references between the regulations and the IMCO Code.

The regulations in 46 CFR part 154 contain certain operating requirements in addition to those in the Code. These are applicable to foreign-flag vessels, except when stated otherwise. In the future, initial and periodic inspection requirements will be added to 46 CFR part 154 but they will not be applicable to foreign-flag vessels.

Since a U.S.-flag gas ship, by meeting the regulations in 46 CFR part 154, will also meet the requirements of the IMCO Gas Code, the Coast Guard issues an IMCO Certificate of Fitness to such ships. The information needed to complete the Certificate of Fitness shall be supplied to the OCMI by the district commander (mmt) which completed the plan review. It should be noted that it is not mandatory for a U.S.-flag ship to have an IMCO Certificate of Fitness, but the owner will probably request one.

Liquefied gas ships are certificated under 46 CFR Parts 30–40 (Subchapter D — Tank Vessels) and endorsed to carry specific cargoes under 46 CFR part 154. New gas ships may also be certificated to carry liquid chemicals under 46 CFR part 153. They must, however, meet all the requirements of 46 CFR part 153.

47–3–10. EXISTING GAS SHIPS

There are two types of existing gas ships. Every gas ship that is not a new ship under the definition in 46 CFR part 154 is an existing gas ship. But, IMCO recognized that many of the gas ships that will be active for the next 20 years or so were under construction or contract such that the new gas ship rules would not apply. Since these ships can and do come very close to meeting the IMCO Gas Code for new ships, this fact should be recognized. IMCO issued RESOLUTION A. 329 (IX) stating that such ships should meet the rules for new ships as closely as possible, taking into account their stage of construction. They could be issued a new ship Certificate of Fitness with endorsements stating where the ship failed to meet the IMCO Code. For ease in referring to ships in this category, they have been dubbed "A329" ships.

The other category of existing gas ships is that group of ships that were in service at the time the IMCO Gas Codes were written. Major changes to these vessels were not envisioned, and were not required for practical reasons, in view of the excellent safety record of gas ships. Some upgrading of existing ships, particularly in firefighting equipment, is required.

The first few LNG ships being built for U.S. flag are in the "A329" ship category. The Coast Guard is treating these vessels in accordance with the IMCO RESOLUTION A. 329 (IX). Their IMCO Certificates of Fitness carry a few endorsements which indicate the areas in which they will be required, as a minimum, to meet the Code for Existing Ships.

A notice of proposed rulemaking is being prepared to outline the specific requirements which existing ships will have to meet. The Coast Guard is not adopting the Code in full, since some of its standards are lower than those that have consistently been required under U.S. regulations and the LOC program. Gas ships will be required to meet all the upgrading requirements specified by the IMCO Code. Additionally, the regulations will detail the procedures and certification necessary for issuance and renewal of the Letter of Compliance (LOC). It is envisioned that LOC vessels will be required to possess an IMCO Certificate of Fitness prior to reissuance of an expired LOC.

For examinations of existing LOC gas ships, the IMCO Code for Existing Ships Carrying Liquefied Gases in Bulk *and* the regulations in 46 CFR part 38 should be used as guidance.

47-3-15. LIQUEFIED GAS BARGES

47-3-15A. GENERAL

Regulations for barges carrying liquefied gases are found in 46 CFR parts 38 and 151. The regulations for gases whose primary hazard is flammability, such as the alkanes and alkenes, are found in 46 CFR part 38; and the regulations for gases with different or additional hazards are found in 46 CFR part 151. The latter group includes ammonia, chlorine, butadiene, vinyl chloride, etc. Eventually, it is planned to update the regulations for liquefied gas barges and consolidate them into one part—46 CFR part 152.

47-3-15B. CHLORINE BARGES

Chlorine is not allowed to be carried on ships in the U.S., but has been carried for many years in barges. Because of the extremely dangerous nature of chlorine, the barges are handled a little differently than most gas barges. Existing chlorine barges, grandfathered under 46 CFR part 151, were required to retro-fit wing tanks to attain double-hull protection. These have been dubbed "Type 1-S" barges.

Due to the unique operating procedures used in chlorine transfer, the Commandant has allowed the quick-closing, remote-activated valves required by 46 CFR part 151 to be kept ashore when not in use and to be controlled or activated from ashore. This dispensation was necessary because of severe corrosion problems with valves when exposed to moisture. This is possible because the chlorine industry, for the most part, uses standardized fittings so that fit-up is not a problem. The valves may be under the control of a tankerman located ashore since no one is normally on the barge during transfer. If personnel are on the barge while chlorine is being transferred (while pumping, but not during fit-up of hoses, etc.), then at least one remote shut-down shall be on the barge.

Deck barges carrying chlorine railroad cars are subject to certain special restrictions. Commandant (G-MHM-1) shall be contacted for further information if this situation is encountered. Because of the peculiarities associated with chlorine barges, if application is made for certification of a new barge, Commandant (G-MHM-1) shall also be contacted.

47-3-15C. LNG BARGES

So far there has only been one LNG barge built, and it is presently out of service. LNG barges are unique since they can neither refrigerate the cargo nor contain the vapor pressure of the cargo at 45°C, as barges carrying other gases are required to do. To insure that LNG vapors are not vented under normal conditions, LNG barges must contain the boiloff for twice the voyage length *or* 45 days, whichever is greater.

47-3-15D. LIQUEFIED HYDROGEN AND OXYGEN BARGES.

Currently, the only shipments of liquefied hydrogen (LH3) and liquefied oxygen (LOX) have been carried out by the National Aeronatics and Space Administration (NASA) on barges operating as "public vessels." No commercial barges have been approved to carry these cargoes.

PART 47-4—LETTER OF COMPLIANCE (LOC) PROGRAM

47-4-1. INTRODUCTION

In the early 1960's, it was recognized that most of the dangerous cargoes carried in bulk on ships were being carried on foreign-flag vessels. The 1960 SOLAS Convention and the regulations in 46 CFR Parts 30-40 (Subchapter D — Tank Vessels) did not adequately address these ships. The LOC program was instituted to insure that these foreign-flag vessels would meet the same standard of safety that a U.S.-flag vessel would be required to meet. The program was intended to insure port safety and, therefore, did not address certain aspects of ship design and equipment. Rather, it was limited to insuring the integrity and operation of the cargo-containment portion of the vessel and related safety systems such as firefighting equipment. Lifeboats, enginerooms, accommodations, etc., were not addressed. Similarly, pollution prevention requirements were handled separately from LOC requirements.

This separation of functions led to some confusion on the part of ship owners and operators (and also Coast Guard inspectors). Ships were being issued a Letter of Compliance (LOC) from Commandant (G-MHM), a letter stating their compliance with pollution prevention regulations by the OCMI (also sometimes referred to as Letter of Compliance), and a Tank Vessel Safety Letter. Thus, there were three different Coast Guard documents required. In fact, some ships were exposed to three different Coast Guard boarding teams in the same port. In order to eliminate this duplication of effort and paperwork and to allow OCMI's to issue LOC's, a new procedure was adopted by the Commandant on 16 February 1978. The present LOC program is described in part 32-2 of this manual.

See also table 47-4-1.1 for a listing of the regulations pertaining to and documents required by foreign-flag tank vessels entering U.S. waters.

47-4-5. IMCO CODES AND CERTIFICATES

The IMCO Codes, which are described in subpart 47-1-10 of this manual, have provided the means to terminate Coast Guard plan review of Letter of Compliance (LOC) vessels. This does not mean, however, that the ships will not continue to be issued LOC's. Because often there are erroneous IMCO Certificates of Fitness issued, and because some special requirements in the U.S. exceed the IMCO standards, the LOC program is still necessary. In addition, the LOC is a vehicle for maintaining control over these vessels to insure compliance with the safety standards set down by IMCO. It should be remembered that these IMCO Codes are *recommendatory*, and some nations view them as strictly voluntary. Waivers, dispensations, exemptions, etc., are fairly common. If the standard of safety established under the LOC program initially is not to be undermined, some control is necessary. Thus, the plan review portion of the LOC program is being discontinued, but the examination of LOC vessels is becoming more and more important. Codes, regulations, plan reviews, and certificates, no matter how good, will not replace a thorough examination. The emphasis of the program is being shifted from Commandant's plan review, etc., to local examinations. This is the primary reason for allowing LOC's to be issued by the OCMI, rather than Commmandant (G-MHM).

In spite of Coast Guard efforts to discontinue its plan reviews, many foreign-ship owners still seek an LOC based on plan review rather than an IMCO Certificate of Fitness. In order to eliminate this practice and to have the flag administrations assume more of the responsibility for their ships, the possession of an IMCO Certificate is becoming mandatory, rather than optional. Under the regulations in 46 CFR part 153, a foreign chemical tanker desiring an LOC must have a valid Certificate of Fitness. The same applies to new liquefied gas ships. When the rules for existing gas ships are adopted, these vessels will also be required to have an IMCO Certificate. Since there is no international code, foreign barges are still issued LOC's based on plan review.

Because there are some nations that do not issue IMCO Certificates of Fitness, it is possible that some ships will not be able to obtain one. When this is the case, the vessel will be reviewed just as if it were a U.S.-flag vessel.

See part 32–2 of this manual for the procedures applicable to LOC vessels.

TABLE 47-4-1.1
APPLICABLE REGULATIONS AND REQUIRED DOCUMENTS FOR
FOREIGN-FLAG TANK VESSELS ENTERING U.S. WATERS

	Chemical/Liquefied Gas Unmanned Barges	Chemical Tankships	New Gas Ships(1)	Existing Gas Ships(1)
Coast Guard Regulations	46 CFR 151 46 CFR 30-40 or 46 CFR 90-109	SOLAS(2) 33 CFR 155, 159, and 164 46 CFR 153	SOLAS(2) 33 CFR 155, 159, and 164 46 CFR 154 (Proposed)	SOLAS(2) 33 CFR 155, 159, and 164 46 CFR 38
IMCO Codes	None	Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Res. A.212 (VII) (IMCO Chemical Code)	Code for the Construction and Equipment of Ships carrying Liquefied Gases in Bulk, Res. A.328(IX) (IMCO Gas Code for New Ships)	IMCO Code for Existing Ships Carrying Liquefied Gases in Bulk or Recommendations Concerning Ships not covered by the Gas Code for New Ships, Res. A.329 (IX).
Documents	Letter of Compliance (U.S.)	Letter of Compliance (U.S.) Cert. of Fitness(3) Comms. Certificates(4) Safety Equip. Cert. Safety Const. Cert. Load Line Cert.	Letter of Compliance (U.S.) Cert. of Fitness(3) Comms. Certificates(4) Safety Equip. Cert. Safety Const. Cert. Load Line Cert.	Letter of Compliance (U.S.) Cert of Fitness(3) Comms. Certificates(4) Safety Equip. Cert Safety Const. Cert. Load Line Cert.

Notes:

(1) See 46 CFR 154.1 (proposed regulation) for definitions.

(2) A foreign-flag vessel whose flag administration is not signatory to SOLAS must meet the requirements of 46 CFR Subchapter D.

(3) A foreign-flag vessel whose flag administration issues an IMCO Certificate of Fitness must have one.

(4) Radiotelephony and Radiotelegraphy Certificates.

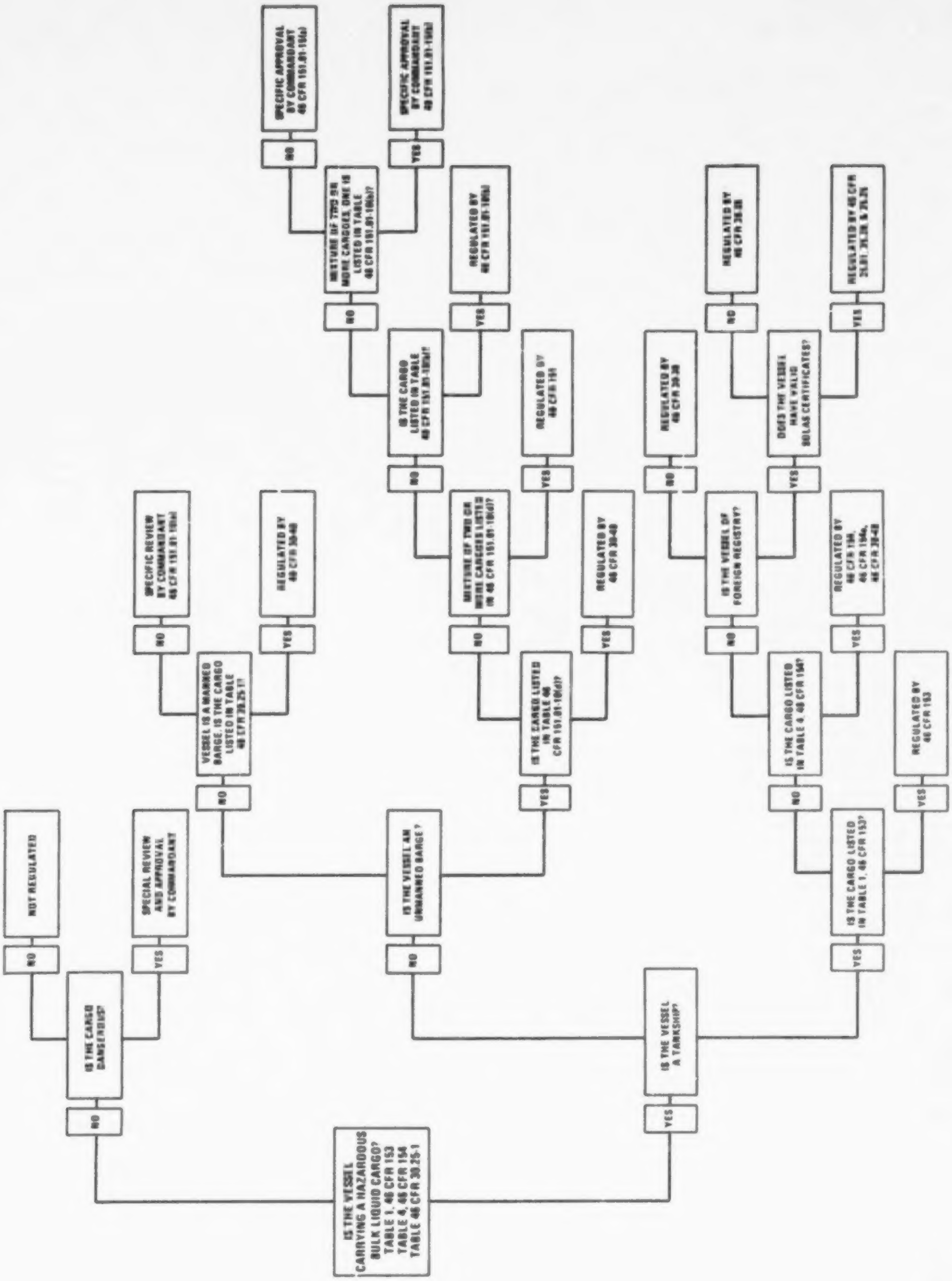
PART 47–5—REGULATIONS APPLICABLE TO HAZARDOUS LIQUIDS AND GASES CARRIED IN BULK

47–5–1. GENERAL

To aid in the identification of regulations concerning hazardous liquids and gases carried in bulk which are applicable to a given vessel and cargo, a "decision tree" is provided in plate 47–5–1.1. The user should start from the left side and gradually work to the right by answering the questions with either a "yes" or a "no." When the sequence is followed correctly, the regulation(s) applicable to a vessel can be identified.

PLATE 47-5-1.1

"Decision Tree" For Hazardous Materials Regulations


IS THE VESSEL CARRYING A HAZARDOUS BULK LIQUID CARGO? TABLE 1, 46 CFR 153 TABLE 4, 46 CFR 154 TABLE 46 CFR 30.25-1
NO
IS THE CARGO DANGEROUS?
NO
NOT REGULATED
YES
SPECIAL REVIEW AND APPROVAL BY COMMANDANT
YES
IS THE VESSEL A TANKSHIP?
NO
IS THE VESSEL AN UNMANNED BARGE?
NO
VESSEL IS A MANNED BARGE. IS THE CARGO LISTED IN TABLE 46 CFR 30.25-1?
NO
SPECIFIC REVIEW BY COMMANDANT 46 CFR 151.01-10(e)
YES
REGULATED BY 46 CFR 30-40
YES
IS THE CARGO LISTED IN TABLE 46 CFR 151.01-10(d)?
NO
MIXTURE OF TWO OR MORE CARGOES LISTED IN 46 CFR 151.01-10(d)?
NO
IS THE CARGO LISTED IN TABLE 46 CFR 151.01-10(e)?
NO
MIXTURE OF TWO OR MORE CARGOES, ONE IS LISTED IN TABLE 46 CFR 151.01-10(e)?
NO
SPECIFIC APPROVAL BY COMMANDANT 46 CFR 151.01-10(e)
YES
SPECIFIC APPROVAL BY COMMANDANT 46 CFR 151.01-10(e)
YES
REGULATED BY 46 CFR 151.01-10(e)
YES
REGULATED BY 46 CFR 151
YES
REGULATED BY 46 CFR 30-40
YES
IS THE CARGO LISTED IN TABLE 1, 46 CFR 153?
YES
REGULATED BY 46 CFR 153
NO
IS THE CARGO LISTED IN TABLE 4, 46 CFR 154?
YES
REGULATED BY 46 CFR 154, 46 CFR 154a, 46 CFR 30-40
NO
IS THE VESSEL OF FOREIGN REGISTRY?
NO
REGULATED BY 46 CFR 30-38
YES
DOES THE VESSEL HAVE VALID SOLAS CERTIFICATES?
NO
REGULATED BY 46 CFR 38-38
YES
REGULATED BY 46 CFR 25.01, 26.38 & 28.25

PART 47-6—BULK DANGEROUS SOLIDS

47-6-1. GENERAL

The regulations regarding the movement of bulk dangerous solids are found in 46 CFR Part 148 (Solids in Bulk). The hazardous products that are permitted to be shipped in bulk are listed in 46 CFR 148.01-7, and the properties of a material which make it hazardous are briefly described in the table in 46 CFR 148.01-7(a). The regulations are somewhat similar to the bulk liquid regulations in that they outline general requirements for all hazardous solid cargoes, and also specify special requirements for individual materials. However, there is an important difference between the bulk liquid and bulk solid rules which is not apparent from the regulations. In compliance with 46 CFR 148.01-9, an unlisted cargo may not be transported without permission of Commandant (G-MHM-2). This sounds the same as the rules for bulk liquids, *but* it only applies if the *shipper* determines that the material he wants to ship meets the definition of a "hazardous material" in 49 CFR Parts 170-189 (Subchapter C — Hazardous Materials Regulations). If the material meets the definition of a "hazardous material" and is not listed by name in the table in 46 CFR 148.01-7, Commandant (G-MHM-2) will review the properties of the material and, if the material can be safely transported in bulk, will issue a special permit describing the procedures and handling requirements for the shipment of the material. This special permit must be on the vessel whenever the hazardous material is being moved. Special permits are given expiration dates, and are usually valid for a period of one year.

Since there are relatively few materials listed in 46 CFR part 148, it is obvious that most bulk solid cargoes are either shipped under special permit or do not meet the definition of a hazardous material. When in doubt about a particular cargo, Commandant (G-MHM-2) should be contacted at FTS: 8-426-1577.

PART 47-7—INTERMODAL PACKAGES AND PORTABLE TANKS

47-7-1. GENERAL

The Materials Transportation Bureau (MTB) in the U.S. Department of Transportation (DOT) has authority for the regulation of packaged shipment of hazardous materials. The regulations for all packaged hazardous materials pertain to any form of "package" which is loaded and off-loaded with contents intact, such as drums, boxes, portable tanks, cylinders, barrels, tank trucks, and railroad tank cars. They do not, however, cover the shipment of military explosives by water (see part 47-9 of this manual).

The Coast Guard has the responsibility to enforce the "package regulations" on vessels, but does not have authority to issue, amend, or waive the regulations. Neither can the Coast Guard issue exemptions under the regulations in 49 CFR part 107. However, there are provisions for "approvals" which can be exercised by the Coast Guard. Some of these approvals are issued by the Commandant (see, for example, 49 CFR 176.76(a)), and others by the district commander (see 49 CFR 176.100). The captain of the port can also approve alternative stowage procedures under 49 CFR 176.65. Since these approvals are provided for in the regulations, they are not considered "exemptions."

The exemptions procedures are contained in 49 CFR part 107. Although exemptions must be issued by the MTB, the Coast Guard is consulted by MTB if the shipment involves the water mode. There is also provision for an emergency exemption in the case of severe economic loss or threat to life. If a shipper requests an emergency exemption, he shall be directed to contact Commandant (G-MHM-2). Also, if a shipment is being made under the provisions of an exemption, the shipper must indicate the exemption number on the shipping papers.

47-7-5. THE HAZARDOUS MATERIALS REGULATIONS, 49 CFR SUBCHAPTER C

47-7-5A. USING THE REGULATIONS

There are two excellent pamphlets available to assist personnel in understanding the use of the "package regulations" in 49 CFR Parts 170–179 (Subchapter C — Hazardous Materials Regulations):

(1) The *Shippers Guide to Hazardous Materials Regulations (Water Mode)* (CG-486) describes the responsibilities of the shipper. It contains examples of how to enter the regulations and determine the hazard class, label, package, marking, special requirements for water shipments, and proper shipping papers. Although the pamphlet is directed at shippers, it is also of value to marine safety personnel in understanding the regulations; and

(2) The pamphlet entitled *Utilizing the Packaged Hazardous Materials Regulations — 49 CFR* (CG-526) is directed at Coast Guard personnel. It describes the procedures which an inspector should follow when boarding a vessel to insure compliance with the regulations.

While both of these pamphlets are valuable, there is no substitution for the regulations themselves, particularly 49 CFR parts 172 and 176.

47-7-5B. INTERPRETATIONS AND EXPLANATIONS

As with any set of regulations, there is generally a need for interpretations and explanations. The Coast Guard provides some explanatory information in port safety bulletins, Commandant bulletins, messages (ALDISTS), etc. The following interpretations and explanations have been issued by the Commandant to aid the industry and marine safety personnel in interpreting and applying the regulations in 49 CFR Parts 170–179 (Subchapter C — Hazardous

Materials Regulations). The paragraph numbers in the regulations to which the explanations apply are provided for the convenience of the reader:

(1) IMCO Classification and Labeling with Corresponding DOT Classification for Shipment by Other Modes of Transportation (49 CFR 171.12(b)):

(a) General. The regulations in 49 CFR 171.12(b) permits shippers to offer hazardous materials (except Class A explosives or radioactive materials) for import or export shipment prepared in accordance with certain provisions of the IMCO International Maritime Dangerous Goods (IMDG) Code in lieu of the corresponding provisions of the DOT regulations. The intent of affording the shipper this option is to facilitate the shipment of hazardous materials in international trade. In accordance with 49 CFR 171.12(b), a shipper may offer a hazardous material for transportation by any mode under the class and label specified for the material in the IMDG Code in lieu of the class and label specified in the DOT regulations, provided (1) the shipper includes in the description of the hazardous material on the rail, highway, or air mode documentation, the name of the DOT class most closely corresponding to the material's IMCO class, and (2) that the material is otherwise offered in accordance with the DOT regulations.

When a shipper elects this option, he is, in effect, reclassifying the material in accordance with the IMDG Code. Therefore, those DOT requirements imposed on the material according to its class (such as placarding and segregation) shall be as provided for in the regulations for the DOT class most closely corresponding to the IMCO classification of the material (e.g., IMDG class 4.3, DOT class flammable solid). All other provisions for shipment of the hazardous material shall be as required for the particular material by the DOT regulations.

Materials which are listed in the IMDG Code, but which are not regulated by DOT, are not subject to the regulations in 49 CFR parts 170–179 and are therefore exempt from Coast Guard enforcement action. Such materials may be labeled as specified in the IMDG Code without subjecting the material to the DOT regulations. To eliminate confusion in transporting such materials, shippers shall be encouraged to include a notation on the documentation that "the material is considered regulated under the IMCO Code only."

(b) Triisobutyl Aluminum. Under the provisions of 49 CFR 171.12(b), 172.203(i)(2), and 172.201(a)(4)(i), triisobutyl aluminum must be entered on the shipping paper as "Pyrophoric liquid, n.o.s. (triisobutyl aluminum) 4.2, flammable solid, IMCO." The package must have the SPONTANEOUSLY COMBUSTIBLE label affixed. Since the material is normally labeled with a FLAMMABLE LIQUID label for domestic shipments other than under the provisions of 49 CFR 171.12(b), the FLAMMABLE LIQUID label may also be affixed as provided for by 49 CFR 172.401(a).

Placarding for IMCO is accomplished with an enlarged SPONTANEOUSLY COMBUSTIBLE label. However, the FLAMMABLE placard must be used for domestic transportation. The IMCO placard may also be affixed.

(2) Not Otherwise Specified (N.O.S.) Entry, Technical Name, and Mixture (49 CFR 172.203(i)(2) and 172.302(b)) for International Water Shipment:

(a) When a mixture contains more than one material classed as a hazardous material, the technical name required in parentheses is the name of the constituent that is of the same hazard class as the total mixture. In addition, if the mixture is labeled with any subsidiary labels, the technical name of the material which compels the use of the subsidiary label must also be shown.

(b) When a mixture contains more than one material of the same hazard class which results in that class or label being applied, only the technical name of the material that is the predominant reason for the class of label must be shown.

(c) When a mixture contains more than one material of the same hazard class in approximately the same percentages, only the name of the material with the highest level of hazard in the class (i.e., lowest flashpoint, most toxic, etc.) need be shown.

(d) When an aerosol contains a mixture classed as a flammable gas, but is charged with a nonflammable gas propellant, both the technical name of the propellant and the principal component contributing to the flammability of the mixture must be shown.

(3) Shipper's Certification (49 CFR 172.204):

(a) The highway common carrier, regardless of whether or not he is the initial carrier, must tender shipping papers to the marine terminal. 49 CFR 171.2 (General Transportation Requirements) provides that ". . . no person may offer or accept a hazardous material for transportation . . .unless that material is properly classed, described, packaged, marked, labeled, and in the condition for shipment as required by this subchapter." In addition, 49 CFR 177.817(a) states that "A carrier may not transport a hazardous material unless it is accompanied by a shipping paper that is prepared in accordance with sections 172.201, 172.202, and 172.203. . . ." Intermediate or interline motor carriers must accurately transfer from the original shipping papers all of the information required by 49 CFR 172.201, 172.202, and 172.203. These interline motor carriers are not, however, required to comply with 49 CFR 172.204 (Shipper's Certification). (See 49 CFR 177.817.)

(b) The water carrier may not transport hazardous materials by vessel without a certificate prepared in accordance with 49 CFR 172.204. Since the shipping papers that are presented by the interline motor carrier are not required to have this certificate, the water carrier must obtain shipper's certification from either the shipper or his authorized representative. In many cases, the shipper satisfies this requirement by preparing a "dock receipt" which he certifies and forwards to the water carrier in advance of the shipment. In other cases, arrangements are made with motor carriers to provide a copy of a certified shipping paper when the shipment is delivered to the pier. There are other acceptable means of providng shipper certification, but it must be reemphasized that this requirement is the responsibility of the shipper.

(c) The certification signature may be printed mechanically on the shipping document by means of an IBM- type system. A preprinted signature is not authorized because it is made before the conditions and acts to which that signature and certification apply have come into existence.

(4) Consumer Commodities (49 CFR 173.1200). Packages in compliance with 49 CFR 173.1200 may be combined in a strong overpack whose gross weight exceeds 65 pounds. The overpack, when marked in accordance with 49 CFR 173.25, can be shipped as a "consumer commodity." The 65-pound limitation in 49 CFR 173.1200 is intended to limit the weight of individual inside packages that may be placed in the strong outside package that is required by this regulation. It does not apply to any additional overpack that is not required by 49 CFR 173.1200.

(5) Interchangeability of IMCO and DOT Requirements for Packaging, Marking, Etc. (49 CFR 176.11(a)). The regulation in 49 CFR 176.11(a) states that ". . .a hazardous material (other than an explosive or radioactive material). . .may be offered and accepted for transportation and transported by vessel. . .if the hazardous material is packaged, marked, labeled, classed, described, certified, and placarded in accordance with the requirements of the IMCO Code. . . ." The word "may" communicates the completely optional nature of this authorization. For example, if a hazardous material is packaged in accordance with DOT but is described, labeled, classed, marked, certified, and placarded in accordance with the IMCO Code, it is still acceptable for shipment by a vessel.

(6) Motor Vehicles and Their Equipment (49 CFR 176.905(1)):

(a) The term "equipment," referred to in subsection 176.905(1), includes any equipment related to the functioning of a motor vehicle or other mechanized equipment. Under this interpretation, each piece of equipment must be considered on an individual basis.

(b) Fire extinguishers are considered as necessary for the functioning of vehicles because they are associated with the mitigation of fires having origins in the vehicles in which they are carried. Also, a tire inflator, placed in a vehicle, can be directly associated with the possible need to inflate a tire on the vehicle.

(c) The same interpretation cannot be given to an oxygen tank, since its use is not directly associated with the operation of a motor vehicle as a motor vehicle.

(7) Differences in stowage and segregation requirements between IMCO and DOT. Under the DOT regulations for most classes of hazardous materials, some stowage and segregation requirements are imposed by the name of the individual substance. The IMDG Code has many more substances listed by name than the DOT regulations, which would handle the substance under a more restrictive N.O.S. category. Changes to the IMDG Code occur prior to their adoption into the DOT regulations. This results in some differences between DOT and IMCO requirements, but these differences are the exception rather than the rule, except for radioactive materials and explosives. For other than radioactive materials and explosives, these differences are generally minor and can be handled by the COTP through approval of alternative stowage procedures authorized under 49 CFR 176.65.

When regulatory interpretations are necessary, Commandant (G-MHM) shall be contacted for questions of a technical nature, and Commandant (G-WLE-1) shall be contacted for assistance with enforcement action(s).

47–7–10. INTERMODAL PORTABLE TANKS

A portable tank is a container having a capacity of greater than 110 U.S. gallons which is designed to be loaded into, on, or temporarily attached to a transport vehicle or vessel. It may be equipped with skids, lifting lugs, or intermodal container corner castings to facilitate handling.

Certain DOT- and Coast Guard-specification portable tanks are specifically authorized by the hazardous materials regulations for the carriage of particular regulated commodities. When a regulated commodity is shipped in such an authorized portable tank, the marking, labeling, and placarding requirements of 49 CFR part 172 apply as to other packagings. Nonspecification portable tanks may also be used to transport regulated commodities when authorized by DOT exemption.

When inspecting a portable tank which carries a regulated commodity, the following items should be kept in mind:

(1) Evidence of any leakage from valves, attachments, or safety relief devices;
(2) Proof that hydrostatic testing has been performed within the prescribed period;
(3) Evidence that all required inspections have been performed in a timely manner;
(4) Evidence that securing and handling attachments are sound; and
(5) Evidence that any special handling or stowage requirements that may be dictated by regulations or exemption are being complied with.

47–7–15. RADIOACTIVE MATERIALS

Radioactive materials are regulated, just as other packaged hazardous materials, under 49 CFR Parts 170–179. Particular requirements for radioactive shipments are found in 49 CFR 173.389 through 173.399 and 49 CFR 176.700.

Three pamphlets concerning radioactive materials have been published jointly by DOT and the Nuclear Regulatory Commission (NRC):

(1) *All About Radioactive Materials Packages – A Guide for Supervisors at Cargo Terminals*;
(2) *How to Handle Radioactive Materials Packages – A Guide for Cargo Handlers*; and
(3) *A Review of the Department of Transportation (DOT) Regulations for Transportation of Radioactive Materials.*

These pamphlets are available from the Materials Transportation Bureau (MTB) in DOT. Coast Guard personnel can obtain copies from Commandant (G-MHM-2).

PART 47-8—MARINE PORTABLE TANKS

47-8-1. GENERAL

Marine portable tanks (MPT's) are liquid-carrying containers which have a capacity greater than 110 U.S. gallons, which are designed to be carried on board a vessel, which can be lifted onto and off a vessel in a filled or an empty condition *or* filled and discharged while on board a vessel, and which are not permanently attached to a vessel. The regulations for these tanks are found in 46 CFR part 64. MPT's are limited to water transportation and to certain listed cargoes (see 46 CFR 64.9 and 46 CFR 90.05-35). Portable tanks constructed and inspected under 46 CFR 98.35 before 1 October 1974 may carry combustible liquids on board vessels until 1 October 1984.

The regulations in 46 CFR 30.01-20, 70-05-25, and 90-05-30 all contain "interpretive rulings" to the effect that the carriage of flammable and combustible liquid cargoes in portable tanks having capacities greater than 110 gallons is bulk carriage. This makes such carriage subject to regulation under authority of 46 U.S.C. 391a, which refers to transportation of flammable and combustible liquid cargo in bulk. The corresponding regulations thus adopt the "bulk" definitions for a flammable liquid (46 CFR 20.01-22) and a combustible liquid (46 CFR 30.01-15), and require that any passenger, cargo, and miscellaneous vessel which transports flammable or combustible liquid cargo in a portable tank have its Certificate of Inspection endorsed with a permit showing the kinds and grades of such liquid cargo that the vessel may transport (see 46 CFR 70.05-30 and 46 CFR 90.05-35).

Delegation and redelegation of authority from the Secretary of Transportation to the Coast Guard (see 49 CFR 1.46) and to the Materials Transportation Bureau (see 49 CFR 1.53) have given the regulatory authority over transportation of all hazardous materials in portable tanks to the MTB, and have made it clear that carriage in portable tanks is governed by the packaged hazardous materials regulations rather than the bulk vessel regulations. The packaged hazardous materials regulations (49 CFR parts 170-179) are interpreted as reinstating the Coast Guard regulations so far as they prescribe portable tank design, construction, stowage, and handling requirements. However, since carriage in portable tanks is deemed "packaged" instead of "bulk," the "packaged" hazardous materials definitions for flammable and combustible liquids (49 CFR 173.115) apply in lieu of the "bulk" definitions, and the Certificate of Inspection endorsement requirement is not applicable. The adequacy of the vessel's firefighting facilities is controlled by 46 CFR 98.30-37 and 39, independent of an endorsement on the Certificate of Inspection.

Since these changes have not yet been incorporated into title 46 CFR, the following guidelines apply to portable tanks carrying flammable or combustible cargoes:

(1) Materials having flashpoints of 200°F or greater and meeting the definition of no other hazard class may be carried on vessels without regard to compliance with 46 CFR 64, 98.30, and 98.35.

(2) Passenger, cargo, and miscellaneous vessels may carry flammable or combustible liquid cargo on vessels in portable tanks without a special permit endorsed on the vessel's Certificate of Inspection.

PART 47-9—EXPLOSIVES

47-9-1. GENERAL

There are two categories of explosives — commercial and military. Commercial explosives are regulated under 49 CFR parts 170–179, along with the other packaged hazardous materials. One difference between commercial explosives and the other hazardous materials is that all shipments of Class A explosives require a loading permit issued by the district commander (see 49 CFR 176.100).

Shipment of Class A explosives in intermodal freight containers is permitted only under special approval of the Commandant (G-MHM-2). The approval document specifies:

(1) The number of containers;
(2) The port, specific vessel, and approximate dates;
(3) The condition of the containers (new or like-new
with nonmetallic, nonsparking interiors, free of protrusions);
(4) The container-handling equipment and sequence of operations; and
(5) Stowage, segregation, firefighting, and emergency actions.

Another important difference between commercial explosive shipments and the other hazardous materials is that a shipper cannot ship explosives under the IMCO class, but must ship them under DOT regulations, even for export to a foreign country.

47-9-5. MILITARY EXPLOSIVES

The shipment by vessel of military explosives is not treated under title 49 CFR. The regulations for marine mode shipment of military explosives do, however, make reference to the marking and labeling requirements in 49 CFR part 172 and the exemption procedures in 49 CFR part 107.

The regulations for handling, stowage, segregation, and packaging of military explosives are contained in 46 CFR Part 146 (Transportation or Storage of Military Explosives On Board Vessels). All shipments of military explosives, except those assigned to Coast Guard Class I (see 46 CFR 146.29–13) and those on public vessels, require a loading permit issued by the captain of the port.

The captain of the port may authorize, in writing, alternative stowage or methods of handling based on equivalent safety (see 46 CFR 146.02–25). All other exemptions must be approved by the Materials Transportation Bureau of DOT. The shipment of military explosives in intermodal freight containers is handled in the same manner as previously described for commercial class A explosives.

A regulatory project is currently underway at Headquarters to incorporate the regulations for the marine-mode shipment of military explosives into title 49 CFR part 176. This project will adopt the United Nations' scheme for classification and segregation of all explosives (military and commercial) for shipment by vessel.

PART 47-10—SHIPS' STORES

47-10-1. GENERAL

Hazardous materials used on board a vessel as ships' stores (other than fuel for the vessel's main machinery) are regulated by 46 CFR Part 147 (Regulations Governing the Use of Dangerous Articles as Ships' Stores and Supplies On Board Vessels). Note that "ships' stores" does not only apply to small cans or bottles. Some vessels have large, boxed decktanks for "ships' stores." A good example of the latter is a deck nitrogen tank used for an inert gas supply.

There are three ways that hazardous materials may be authorized for use on board regulated vessels:

(1) Authorization in table 46 CFR 147.05-100;
(2) Authorization by a ships' stores certification; and
(3) Special arrangement with the Commandant.

Certain commonly used hazardous materials are listed in table 46 CFR 147.05-100 along with any necessary precautions or restrictions for their safe stowage and handling. The only requirements for these commodities is that they be used in accordance with the table. Many commodities are not listed in the table, and it is necessary for the vendor or manufacturer of the product to obtain a ships' stores certification for the product from Commandant (G-MHM-2) before it may be accepted, stowed, or used on board a vessel. The certification procedure and a reproduction of the certification logo are found in 46 CFR 147.03-3 through 147.03-6.

In certain cases, such as shipboard systems utilizing hazardous materials, special arrangement must be made to insure both safety and compliance with the regulations. In these cases, Commandant (G-MHM-2) shall be contacted.

PART 47–11—FUMIGATION

47–11–1. GENERAL

Interim regulations for shipboard fumigation are found in 46 CFR part 147A, and they apply to foreign and domestic vessels as prescribed in 46 CFR 146.02–2. These regulations are presently under review and have been found to be inadequate when addressing unmanned barges, LASH or SEABEE barges carried on board ships, and intermodal freight containers. The rules for these particular applications are contained in two special permits—SP 2–75 and SP 52–75.

A regulatory project is underway at Headquarters to revise the regulations in 46 CFR part 147A which will obviate the need for these special permits.

Questions concerning fumigation or fumigants shall be directed to Commandant (G-MHM-2).

CHAPTER 48 - VESSEL INSPECTION RECORDS, REPORTS, AND CERTIFICATES

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PART 48-1 -- REPORTS AND RECORDS

48-1-1. INTRODUCTION

This part of the manual contains specific instructions pertaining to the various standard forms used for the required vessel inspection records and reports. However, these instructions should not be interpreted restrictively so as to limit the benefits which can be derived from proper use of the forms. OCMI's may permit adaptation in the use of the forms to suit local needs practically.

48-1-1A. PURPOSE.

Standard inspection forms are developed to:

- Eliminate and reduce the collection and re-recording by marine inspectors of information not absolutely necessary to the Coast Guard; and
- Provide a uniform guide which may be adjusted to reflect the scope of each inspection to accommodate the peculiar needs of an individual marine safety unit.

48-1-1B. DEVELOPMENT

Development of forms is predicated upon the following two concepts:

(1) Inspection report forms are the primary media for the transmittal of information from the inspector to the OCMI who is responsible for the certification of the vessel; secondarily, they serve as a record of such inspections and certifications.

(2) The scope of any inspection is dictated by Federal regulations and additional instructions as modified within the discretionary authority of the OCMI. In view of the many types of vessels and inspections covered by each inspection report form, the forms themselves cannot be construed as limiting or otherwise delineating the required scope of an inspection.

48-1-1C. USE

The use of the standard forms presumes that:

(1) OCMI's are vested with the authority to adjust the forms to fit local needs. Additional information may be required or certain items eliminated; however, the primary objective of eliminating unnecessary paperwork by inspectors shall be maintained.

(2) An entry made in a "checkoff" box by an inspector indicates that the item is satisfactory to the inspector. It does not necessarily mean that all the individual "memory joggers" under an item have been checked nor that they are appropriate. The striking of those items not considered appropriate is

unnecessary; however, if the total inspection item is not applicable, it should be stricken and initialed by the inspector.

(3) The practice of attaching requirement notices, repair specifications, and similar papers eliminates the need for re-entering such data on the forms. Other practices which eliminate or reduce paperwork by inspectors and which are not specifically prohibited by the instructions governing the use of the form, shall continue.

48-1-3. VESSEL INSPECTION BOOKS AND INSPECTION REPORTS

The importance of accurate and complete reports is emphasized because they serve as a public record of the inspection, and reflect upon the professionalism and efficiency of the marine inspector, the CVS program, and the Coast Guard as a whole. The provisions of this subpart shall be followed in the preparation of inspection books in all cases unless specified otherwise. This subpart indicates which inspection report forms are necessary for various types of inspection or types of vessels involved.

48-1-3A. POLICY

A written report is required for all inspections accomplished by personnel. In those cases where form books are not specified (i.e., factory inspections, uninspected vessel inspections, other special inspections), a locally prepared inspection form shall be submitted.

48-1-3B. INITIAL INSPECTION

All marine inspectors shall familiarize themselves with the contents of parts 30-1 and 48-1 of this manual, concerning initial inspections during new construction work and the required reports and entries in the "Remarks" section of inspection books covering the series of inspections required by various regulations. Normally, the inspector assigned to the shipyard will make frequent visits throughout the vessel's construction and fitout period, with a final inspection of the vessel and its equipment upon completion. The changing of inspectors during inspection of a vessel should be avoided; however, in view of the small size of some offices and the limited number of inspectors assigned, it may be necessary to have alternate inspectors. In cases where several inspectors have been involved in a vessel's inspection, the Chief, Inspection Department will ensure that the vessel is visited as necessary for continuity and completeness of the inspection.

48-1-3C. NEW CONSTRUCTION REPORTS

A "construction log" is required for all vessels inspected during construction. This log may be included in the Remarks section of the appropriate inspection or drydock booklet, or in a separate book (such as a green record book). If a separate log (book) is used, it should be referenced in the Remarks sections of the appropriate CG-840 inspection books used for the initial inspection. The initial inspection of a newly constructed vessel includes both an inspection for certification and a drydock examination. The appropriate inspection booklet(s) specified in subpart 48-1-15 shall be utilized to record the initial inspection.

48-1-3D. PREPARATION OF INSPECTION BOOKS

(1) An entry shall be made in the "Remarks" section for all visits to the vessel. Time is accounted for in the Record of Inspection section (add pages if necessary), and time in attendance shall be indicated on all inspection report forms, including locally prepared forms.

(2) The front cover and vessel inspection pages shall be completed; where the information does not apply, place the letters (NA).

(3) Numbered Blocks: The initials of the inspector who completed the inspection of the item shall be placed in the block. If the item does not apply to the vessel being inspected, the block shall be striken by a line through the item, with "NA" printed above the line and the inspector's initials placed to the right of the line. This clarifies which inspector determined that the item was not required.

(4) Unsatisfactory Conditions: The block shall not be initialed if the item is not satisfactory. Instead, the deficiency shall be described on the blank page opposite the item, with the corresponding number and date the entry is made. If the deficiency is corrected prior to completion of inspection, that fact shall be noted on the same page, with the date and the inspector's initials for the item. If the item is not completed satisfactorily before completion of the inspection and a requirement issued on Form CG-835, this should be noted on the page opposite the item. Partially completed items should be noted, as in these examples (CG-840A): "A-2. (DATE) All satisfactory except one closure dog missing for hatch cover to after void; see attached CG-835" or "A-2. (DATE) Not satisfactory. See remarks on attached CG-835."

(5) Sub-Items: These are included under most of the numbered items as "memory joggers" of items that should not be overlooked, and are not intended to cover all possible areas of inspection. Some sub-items may not apply to the vessel under inspection. It is not necessary to line these out, nor to initial or check these sub-items.

(6) Extensive Repairs/Alterations: These shall be briefly described on the page opposite item and referred to in the Remarks section and the attached copy of shipyard specifications (Example: "A-1. Extensive bottom and side shell plating required replacement due to general wastage. See Remarks and attached specifications").

(7) Remarks Section: The Remarks section is intended as a running diary of the inspector's conduct of the inspection, to include useful miscellaneous information not covered in other parts of the book. This should be written in sufficient detail so that a relieving inspector will fully understand the status of the progress of the inspection. All deficiencies found should be referred to in the Remarks section, as well as notations covering corrections of deficiencies. The first entry should fully describe the vessel being inspected

(sketch plan/profile or appended photograph) and the final entry should summarize any deficiencies remaining outstanding upon completion of inspection.

(8) Diary Entries: The following sample entries are typical but not mandatory; the inspector should use his/her own wording to fully describe the inspection (subject to approval by the OCMI):

(a) "Visited vessel in company with (owner's representative) on (DATE) at (PLACE) to conduct drydock examination for credit. This is a standard single-skin tank barge, with 8 integral cargo tanks, a raked void forward, and a box void aft as shown by sketch. There is one cylindrical 7500-gallon diesel fuel tank on deck. The barge is approved for the carriage of Grade B and lower products."

(b) "Examined all PV valves and flame screens after they were opened for inspection. All were found satisfactory with exception of the PV valve and flame screen to No. 1-P cargo tank, which was defective due to torn flame screen and valve clogged with hardened asphalt. Required immediate correction."

(c) "Examination of the vessel's eight combination fire nozzles revealed they were in good condition and suitable for this type of vessel, which requires only the solid stream nozzle. However, since these nozzles (described on page 9) are not Coast Guard-approved, the matter was referred to the OCMI. After I witnessed a test which indicated superior performance of these nozzles compared to the approved straight bore, the OCMI permitted acceptance under special consideration provisions of 46 CFR 175.25-1."

(d) "All items shown on pages 4 through 7 were inspected and found satisfactory with the exception of item B-5, due to fire axes not marked with vessel's name. See attached CG-835."

(e) "Visited vessel to inspect progress of construction of the vessel's hull and internal structural members. All work was proceeding satisfactorily in accordance with approved plans. Several areas in the port fuel tank were marked for pick-up welding."

(f) "Witnessed a satisfactory four foot hydro on No. 2-P cargo tank, including examination of hull and deck area in way of tank. A final inspection of the vessel's entire underwater body was made prior to launching and found satisfactory. Initial drydock examination completed."

(g) "Initial inspection for certification completed with four (4) outstanding deficiencies noted by attached CG-835's. Issued temporary Certificate of Inspection this date and recorded information in Bridge Record Card."

Inspectors shall keep all inspection books up to date. Necessary entries should be made at the end of each day, and in no case shall be made later than the following day. Upon completion, the last entry of the inspection book should state: "Inspection completed with no outstanding requirements (or completed with the following requirements outstanding) ..."

48-1-3E. MERCHANT MARINE INSPECTION REQUIREMENTS, FORM CG-835

Copies of all CG-835's issued shall be attached to the inspection book. In preparing the form to cover a deficiency where a specific regulation applies (subpart 30-2-10B), it should be cited "Vessel is to be placed on drydock in a gas-free condition for Coast Guard examination in accordance with 46 CFR 31.10-20 without delay," or "No later than the next cargo transfer operation; the cargo piping, pressure gauges, and cargo pump relief valves shall be tested by a Tankerman at maximum working pressure as required by 46 CFR 35.35-70, and this office notified by letter of the results." However, CG-835's cited as "Comply with 76 CFR 35.35-70" containing no amplifying information shall be avoided. Where the deficiency is of a general nature not covered by a specific regulation, no reference is required (example: "Crop and renew as original eight feet of deck knuckle in No. 2-P cargo tank in way of the wasted area covered by a doubler"). Where a specific time limit to satisfactorily comply with a requirement is given, the time limit should be in accordance with OCMI policy.

48-1-3F. FOLLOW-UP

After completion of an inspection, when a deficiency is corrected at a later date to the satisfaction of the inspector or Chief, Inspection Department, a dated notation shall be placed in the inspection book and the item block initialed.

A similar notation should be placed in the inspection book if a deficiency is completed at another port other than the port of issuance of the requirement.

48-1-5. VESSEL INSPECTION REPORTS, BOOKLET FORM CG-840 SERIES

48-1-5A. GENERAL

The following vessel inspection reports have been developed as standard booklet forms in the CG-840 series:

CG-840A - Hull Inspection Book, Condition of Vessel;
CG-840AA - Hull Inspection Book, List of Equipment;
CG-840B - Boiler Inspection Book, Condition of Vessel;
CG-840BB - Boiler Inspection Book, List of Equipment;
CG-840E - Barge Inspection Book;
CG-840F - Control Verification or Examination of Foreign Vessel;
CG-840H - Drydock Examination Book;
CG-840S - Tankship Hull Inspection Book;
CG-840T - Small Passenger Vessel Inspection Book.

In addition, the Commandant is developing an inspection booklet form for mobile offshore drilling units (MODU's).

These booklets have been designed for insertion into a pocket-size notebook. Most entries are the "checkoff" type, and the booklet used by the inspector during the inspections can be submitted as the final report to the OCMI. The Certificate of Inspection, Form CG-841, CG-3753, or CG-4678 (as appropriate), shall be used in conjunction with other applicable inspection reports for every inspection for certification of a vessel. The general use of the various vessel inspection booklets is described in table 48-1-5A.1.

Report booklets for use in the more complicated inspection of larger vessels have been separated into "hull" and "boiler" components. In order to avoid repetitious recording of information, these components have each been separated into "condition" and "equipment" sections. The booklet forms used by the inspector on larger vessels are:

(1) CG-840A--Hull Inspection Book, Condition of Vessel;
(2) CG-840S--Tankship Hull Inspection Book, Condition of Vessel;
(3) CG-840B--Boiler Inspection Book, Condition of Vessel;
(4) CG-840AA--Hull Inspection Book, List of Equipment;
(5) CG-840BB--Boiler Inspection Book, List of Equipment.

Copies of the two Lists of Equipment shall be appended to each newly issued COI to remain with the vessel for ready reference and for use at subsequent inspections. Renewal of the Lists of Equipment is required only when the recorded data becomes obsolete. Minor pen-and-ink corrections, dated and initialed by the inspector, are acceptable.

No separate list of equipment shall be prepared in the reporting of inspections of small passenger vessels (T-boats) or freight and tank barges, nor will any part of the inspection report normally be attached to the COI. Form CG-840T (Small Passenger Vessel Inspection Book) and Form CG-840E (Barge Inspection Book) have been provided for use on these vessels.

Inspectors shall always refer to previous inspection reports during an inspection, and the appropriate COI shall be used by the inspector in conjunction with other applicable inspection reports for reference and for recording vessel data. The information contained on the certificate has not been duplicated on Form CG-840AA or CG-840BB.

A reinspection shall be reported in the same booklet used for a inspection for certification.

48-1-5B. INSPECTIONS FOR CERTIFICATION

48-1-5B(1). Forms CG-840A, CG-840AA, CG-840B, CG-840BB, and CG-840S.

Forms CG-840A (Hull Inspection Book, Condition of Vessel), CG-840B (Boiler Inspection Book, Condition of Vessel), and CG-840S (Tankship Hull Inspection Book) shall be used for recording the condition of a vessel and its equipment and certain other inspection information indicated on the forms (see part 30-6 of this manual concerning inspection for certification). The inspector(s) shall complete one copy of each applicable form for each inspection for certification; this copy shall be retained as the OCMI's record.

Forms CG-840AA (Hull Inspection Book, List of Equipment) and CG-840BB (Boiler Inspection Book, List of Equipment) shall be used for recording vessel equipment data. At the initial inspection for certification, the inspector(s) shall complete one copy of each form. All information concerning unusual equipment or unique inspection procedures required shall be listed in the Remarks section (continuing on the back of the form if necessary) at the initial inspection or whenever new equipment is installed (see subpart 31-3-60 of this manual). A typewritten copy of each form shall be prepared and affixed to the back of the completed COI prior to its delivery to the vessel for posting. Copies of Forms CG-840AA and CG-840BB shall be retained as the OCMI's record.

At each subsequent inspection for certification, all data on Forms CG-840AA and CG-840BB shall be checked by the inspector for accuracy. The inspector shall make any necessary corrections to the data by striking items and writing in corrections, which must be dated and initialed. Upon completion of the inspection for certification, Forms CG-840AA and CG-840BB attached to the expired COI shall be submitted to the OCMI. If the corrections are few and the forms still in good condition, the same forms may be affixed to the new COI and returned to the vessel. If the corrections are many, if the condition of the old forms is poor, or if the OCMI has no file copy of the forms covering the particular vessel, a new typewritten set of forms shall be completed and attached to the back of the new certificate prior to its delivery to the vessel for posting. When the same forms are reissued, any corrections made by an inspector since the last inspection for certification shall be duplicated on the OCMI's file copies. When new forms are issued, the OCMI shall retain a file copy.

48-1-5B(2). Forms CG-840E and CG-840T. Forms CG-840E (Barge Inspection Book) and CG-840T (Small Passenger Vessel Inspection Book) shall be used to record the condition of such vessels and their equipment, and other inspection information indicated on the forms. The inspector shall complete one copy of Form CG-840E or CG-840T, as applicable, for each inspection for certification; the completed inspection books shall be retained as the OCMI's record. Previous inspection reports covering the same vessel shall be used for reference purposes during the inspection. In all cases, the inspector shall verify the accuracy of the equipment data entered in his inspection book.

48-1-5B(3). Forms CG-841, CG-3753, and CG-4678. The appropriate Certificate of Inspection form shall be used for recording the vessel data indicated on the form. At the initial inspection for certification, the inspector shall complete the vessel data sections of the applicable form. At each subsequent inspection for certification, the inspector shall ensure the accuracy of all data entries on the previous COI. In this regard, reference shall be made to all amendments to the certificate issued on Form CG-858 (Certificate of Inspection Amendment). The inspector shall correct any entry on the old COI found to be in error; all corrections shall be initialed. The COI completed by the inspector or the corrected copy of the previous certificate shall be used in typing the new form for issuance to the vessel. No reference to other inspection reports is necessary in completing the new COI.

See part 48-2 of this manual for information concerning the completion of the Certificate of Inspection forms.

48-1-5C. REINSPECTIONS

48-1-5C(1). Forms CG-840A, CG-840B, CG-840AA, CG-840BB, and CG-840S. Forms CG-840A (Hull Inspection Book, Condition of Vessel), CG-840B (Boiler Inspection Book, Condition of Vessel), and CG-840S (Tankship Hull Inspection Book) shall be used for recording the condition of the items inspected at re-inspections (see part 30-7 of this manual concerning vessel re-inspections). The inspector shall submit one copy of each form to the OCMI for each reinspection, and the forms submitted shall be retained as the OCMI's record.

Forms CG-840AA (Hull Inspection Book, List of Equipment) and CG-840BB (Boiler Inspection Book, List of Equipment) may also be used for reference purposes during a reinspection. If equipment changes are made which affect the recorded data, the inspector shall make corrections to the forms carried on the vessel, and date and initial each correction (see section 31-3-60B of this manual). Any such changes shall be explained in the Remarks/Diary section of the inspection booklet.

48-1-5C(2). Forms CG-840E and CG-840T. Forms CG-840E (Barge Inspection Book) and CG-840T (Small Passenger Vessel Inspection Book) shall be used for recording the condition of the items inspected at reinspections for these types of vessels. Completion of the equipment data parts of the forms is not required. The inspector shall submit one copy of Form CG-840E or CG-840T, as applicable, for each reinspection of barges and "TL" vessels. In the case of "TS" vessels, each form shall be used for the inspection for certification and two annual reinspections. All forms submitted shall be retained for the OCMI's record, and all previous inspection reports covering the same vessel shall be used for reference purposes during a reinspection.

48-1-5C(3). Forms CG-841, CG-3753, and CG-4678. The vessel's Certificate of Inspection form, whichever is appropriate, should also be used for reference purposes during a reinspection. Any necessary corrections shall be made by the issuance of Form CG-858 (Certificate of Inspection Amendment).

48-1-5D. DRYDOCK EXAMINATIONS

48-1-5D(1). Forms CG-840E and CG-840H. Form CG-840E (Barge Inspection Book) shall be used as the inspector's record of a drydock examination of a barge only. Form CG-840H (Drydock Examination Book) shall be used as the inspector's record for all other drydock examinations (see part 30-8 of this manual concerning drydock examinations). The inspector shall complete one copy of form CG-840E or CG-840H for each drydocking, and this form shall be retained for the OCMI's record.

48-1-5D(2). Other Inspection Forms. Previous inspection reports covering the same vessel shall be used for reference purposes during drydock examinations. If equipment changes occur during a drydock examination which affect the recorded data on Forms CG-840AA or CG-840BB, the inspector shall make the appropriate corrections to the forms and shall date and initial each correction. Such changes should be explained in the Remarks/Diary section of the inspection booklet.

48-1-5E. OTHER INSPECTIONS

Forms CG-840A (Hull Inspection Book, Condition of Vessel), CG-840B (Boiler Inspection Book, Condition of Vessel), CG-840E (Barge Inspection Book), CG-840S (Tankship Hull Inspection Book), and CG-840T (Small Passenger Vessel Inspection Book) may be used to record inspection information during any special vessel inspection which is extensive enough to warrant their use. Previous inspection reports covering the same vessel shall be used for reference purposes at any such inspection.

48-1-5F. CONTROL VERIFICATION OR EXAMINATION OF FOREIGN VESSEL

Form CG-840F (Control Verification or Examination of Foreign Vessel) shall be used for recording the condition of a foreign-flag vessel and its equipment, and certain other vessel examination information indicated on this form. The form shall only be used for those vessels indicated on the front cover of the form. The inspector shall complete one copy of the form for each vessel examined and this copy shall be retained as the OCMI's record.

48-1-5G. FOREIGN-FLAG TANKSHIP INSPECTIONS AND EXAMINATIONS

Form CG-840S (Tankship Hull Inspection Book) is a dual-purpose, inspection/examination record for U.S.- and foreign-flag tankships. Detailed instructions for the use of this form can be found in the front of the booklet form itself. The inspector shall complete one copy of the form for retention as the OCMI's record.

48-1-10. MVI INSPECTION RECORD, FORM CG-3821

48-1-10A. GENERAL

To maintain complete vessel inspection histories, inspections for certification are reported to the Commandant by copy of the appropriate COI (see section 48-2-5A). All other significant inspections shall be reported on Form CG-3821, MVI Inspection Record (RCS-G-MVI-4031). This form shall be used to report significant inspections (other than inspections for certification), major repairs, alterations, and vessel status changes affecting the COI. For example, a vessel may undergo drydocking, extensive repairs, and alterations in conjunction with an inspection for certification. It is important that these events are reported on Form CG-3821 to ensure that these events are properly reflected in the Commandant's records.

48-1-10B. DISTRIBUTION

The distribution of Form CG-3821 is as follows:

READEX FICHE best copy available

(1) Original -- To Commandant (G-MVI) via the district commander (m).
(2) Copy -- To issuing OCMI's file.
(3) Copy -- To OCMI last certificating the vessel, if applicable.

48-1-10C. WHEN SUBMITTED

Form CG-3821 shall be submitted to Commandant (G-MVI) as a record of the following:

(1) Reinspections;
(2) Drydockings of vessels for credit;
(3) Major repairs;
(4) Major alterations;
(5) Inspection and testing of automated boiler or propulsion machinery control systems;
(6) COI's revoked, surrendered to the Coast Guard, or returned to the vessel;
(7) Vessel status changes such as lay-up or scrapping; and
(8) Miscellaneous transactions, such as the refusal to issue a Form CG-840F Verification for Foreign Vessel, which can be adequately explained in the remarks section.

It should be noted that the Structural Failure Report (Form CG-2752) and Equipment Failure Report (Form CG-2752A) are not replaced by Form CG-3821. These reports shall be prepared and submitted in accordance with subpart 30-5-35 of this manual.

Sanitary inspections and noncredit drydock examinations should not be reported on Form CG-3821 unless important irregularities are found. It is emphasized, however, that a complete record of significant events is required, and Form CG-3821 should be submitted in cases of doubt.

48-1-10D. INSTRUCTIONS FOR PREPARATION

Major alterations required to be reported on Form CG-3821 are those involving the safety of the vessel to such an importance that plans are required to be submitted and approved in accordance with applicable vessel inspection regulations.

Actions taken shall be indicated on Form CG-3821 by checking the appropriate box. Remarks should be made when reporting non-certification inspections, major repairs or alterations, and COI actions as appropriate:

(1) The reason(s) for other inspections should be stated;

(2) A summary of major repairs or alterations accomplished on the vessel should be provided;

(3) A brief explanation of the reason(s) for certificate actions shall be given.

(4) Changes in the status of a vessel should be reported by using the Remarks space on the form. This would include such actions as being removed from documentation; transferred to a foreign flag, scrapped, or dismantled or placed in a laid-up condition; or returned to operation from a laid-up condition;

(5) When a casualty occurs causing the loss of a vessel, the COI shall be considered revoked, and a Form CG-3821 indicating this fact shall be submitted to Commandant (G-MVI) in addition to any other casualty reports required (see subpart 30-5-35 of this manual);

(6) Any other significant change in the status of an inspected vessel shall be reported to Commandant (G-MVI) on Form CG-3821 to keep vessel history files current.

The following shall be used as a guide in determining major repairs which are required to be reported:

(1) Vessel's hull and outboard fittings:

(a) Repairs of Class I and II structural failures;
(b) Replacements which involve the main hull structure at a location which experience has indicated is a potential source of a dangerous failure. Such locations include the strength deck, inner bottom, and the side and bottom shell and attachments thereto such as bilge keels, sea chests, and bulwarks;
(c) Replacement of tailshaft or rudder.

(2) Boilers:

(a) Extensive retubing of boilers;
(b) Replacement of boiler drums, furnaces, etc.;
(c) Welded or riveted repairs to boiler drums, shells, furnaces, and combustion chambers.

(3) Main propulsion machinery:

(a) Replacement or removal of engines;
(b) Replacement of major components such as turbine rotors, diesel engine crankshafts, etc.;

(4) Auxiliary machinery:

(a) Replacement or removal of auxiliary power generators, pressure vessels, fire pumps, bilge pumps, steering systems, etc.

(5) Safety installations:

(a) Replacement or removal of complete systems such as the general alarm system, fire detection system, fire extinguishing system, etc.

(b) Replacement or removal of watertight doors, firescreen doors, fire control bulkheads, etc.

(6) Lifesaving equipment:

(a) Replacement or removal of davits, lifeboats, life rafts, life floats, buoyant apparatus, etc.

48-1-15. REPORT OF MATERIAL INSPECTIONS, FORM CG-2801

48-1-15A. PURPOSE

The Report of Material Inspections, Form CG-2801 (RCS-G-MVI-4025), provides the Commandant with statistical data based upon the number and type of inspections completed within the reporting zone during the period covered by the report. The data compiled from the reports of all OCMI's is the basis for the Commandant's reports on CVS Program activities to the Secretary of Transportation, and provides the Commandant with the necessary information relating to inspections carried out within each marine inspection zone.

48-1-15B. WHEN REQUIRED AND DISTRIBUTION

Form CG-2801 shall be prepared by each OCMI in triplicate. The original shall be sent to Commandant (G-MVI), the duplicate to the district commander (m), and the triplicate copy retained by the originating OCMI. This form shall be submitted monthly, and no annual summary report is required.

48-1-15C. INSTRUCTIONS FOR PREPARATION

Instructions governing the preparation of Form CG-2801 are printed on the back of the form and should be followed carefully.

48-1-20. LIST OF MERCHANT VESSELS UNDER CONSTRUCTION OR CONVERSION, FORM CG-2801A

A monthly report of vessels under construction or conversion shall be prepared by each OCMI in quadruplicate on Form CG-2801A (RCS-G-MVI-4027). The original and duplicate copy shall be submitted to Commandant (G-MVI), the triplicate copy to the district commander (m), and the quadruplicate copy retained in the originating OCMI's file. The report shall be submitted when activity concerning construction or conversion is indicated, and it shall be prepared in such a way that vessels under construction or conversion are listed separately, with vessels under construction listed first. The report shall show the actual date each vessel listed has been completed and certificated during the period of the report. Non-certificated Military Sealift Command (MSC) vessels shall also be included on this form in the same manner as all certificated vessels.

48-1-25. MEASUREMENT OF FURNACES, FORM CG-836

Form CG-836 shall be completed by the inspector as deemed necessary by the OCMI when an inspection is performed on a fire-tube boiler. The completed report shall be submitted to the OCMI and retained in the vessel's file.

48-1-30. SEALING PLIER DIES

The OCMI shall maintain a complete inventory of all safety valve sealing plier dies on hand, as well as a listing of the numbers of the dies assigned to marine safety personnel and the number of those dies held as spares. Whenever a safety valve sealing plier die is lost or stolen, or its custody is transferred to another office, the OCMI shall report the facts by letter to Commandant (G-MVI) via the district commander (m).

No report is necessary when only changes in the local assignment of dies occur.

48-1-35. RENEWAL OF FUSIBLE PLUGS.

The regulations in 46 CFR 2.20-40(c) and 46 CFR 52.01-50(k) require the vessel's chief engineer to submit a written report to the OCMI who issued the vessel's COI when fusible plugs are renewed in boilers at other than the inspection for certification and when no Coast Guard inspector is in attendance. Such reports shall be reviewed by the OCMI to ensure that all information required by these regulations is included, that the plugs installed are of an approved type, and that further inspection or investigation is indicated. These reports shall be filed with the other inspection records for the vessel. Disposal of these reports shall be the same as for other inspection reports.

48-1-40. PERFORMANCE OF AUTOMATED MACHINERY AND EQUIPMENT

Upon completion of underway tests of initial installations, a letter report reflecting the performance of the vessel's automated machinery and equipment shall be submitted to Commandant (G-MVI) in accordance with Commandant Instruction 16711.1 (series). Subsequent inspections and testing shall be reported on Form CG-3821. See also Navigation and Vessel Inspection Circulars (NVC's) 1-69 and 7-73 for additional information concerning automated main and auxiliary machinery.

48-1-45. INSPECTION RECORDS OF THE PUBLIC HEALTH SERVICE

The U.S. Public Health Service (PHS) conducts a sanitation inspection program aboard merchant vessels and maintains official certificates pertaining to such inspections. PHS vessel sanitation inspectors are required to verify the presence of these papers prior to their inspections in order to eliminate the possibility of duplication. In accordance with its request, the PHS is authorized to use the pilothouse metal wall containers installed on ocean and coastwise vessels for the Coast Guard Vessel Inspection Record, Form CG-2832. Official PHS certificates of sanitation inspections aboard merchant vessels may remain in the metal containers provided they do not interfere with the regular use of the container (see subpart 48-2-80 of this manual).

48-1-50. SPECIMENS OF STANDARD STATION BILLS, FORMS CG-848 SERIES

Form CG-848 and the additional forms in the CG-848 series (A, B, C, and E) regarding standard station bills are provided by the Commandant to be used as guides for masters and mates of vessels while drawing up suitable station bills for their vessels.

TABLE 48-1-5A.1
USE OF VESSEL INSPECTION BOOKLETS

FORM	TYPE OF INSPECTION	TYPE OF VESSEL
CG-480T	(1) Inspection for Certification (2) Reinspection	(1) All small passenger vessels (except steam vessels) which are: (a) Mechanically propelled, less than 100 GT (any length); (b) Sail vessels, not over 100 GT; and (c) Barges, not over 100 GT. (2) All motorboats of more than 15 GT carrying freight for hire.
CG-840E[1]	(1) Inspection for Certification (2) Reinspection (3) Dry Dock Examination	(1) All tank barges. (2) All seagoing barges, 100 GT and over. (3) All inspected barges carrying dangerous cargo.
CG-840S	(1) Hull Examination	(1) U.S. and Foreign Tankships
(Being developed)	(1) Inspection for Certification (2) Reinspection	(1) Mobile Offshore Drilling Units (MODU's)
CG-840A CG-840B[2]	(1) Inspection for Certification (2) Reinspection	(1) All other inspected vessels. (Those for which forms CG-840T, CG-840E, or CG-840S are not used.)
CG-840AA CG-840BB	(1) Inspection for Certification	
CG-840H	(1) Drydock Examination	(1) All inspected vessels except those for which Form CG-840E is used.
CG-840F	(1) Control Verification	(1) Foreign vessels for issuance of SOLAS certificates. (2) Control Verification of SOLAS Convention vessels. (3) Canadian vessels to which SOLAS does not apply. (4) Non-Convention cargo vessels.

NOTES:

(1) If deemed appropriate, the OCMI may use forms CG-840A, CG-840AA, CG-840B, CG-840BB, and CG-840H for large, manned barges.

(2) U.S. Tankships also.

PART 48-2 -- VESSEL INSPECTION CERTIFICATES

48-2-1. GENERAL

This part of the manual contains the policy and instructions for completing the various vessel inspection certificates and the pilothouse inspection record card. The guidance is provided to standardize, as far as practicable, the entries on the various certificates and the record card. No spaces on a vessel's inspection certificate or other document should be left blank. A hyphen should be entered in blank spaces to indicate that the item was not merely forgotten.

48-2-5. CERTIFICATE OF INSPECTION, FORM CG-841

48-2-5A. COPIES REQUIRED AND DISTRIBUTION

The Certificate of Inspection, Form CG-841, shall be completed by the OCMI with sufficient copies for the following distribution:

(1) Original -- Issued directly to the master, owner, operator, or agent of the vessel.
(2) Copy -- Issuing OCMI's file copy.
(3) Copy -- To Commandant (G-MVI) via the district commander (m).
(4) Copy -- To the OCMI of the zone in which the vessel was last certificated (if applicable).
(5) Copy -- To the owner or agent of the vessel (if requested).

48-2-5B. CERTIFICATE ENTRIES

(1) Expiration Date. One year from the date of completion of the annual inspection or two years from the date of completion of the biennial inspection.

(2) Vessel. The name of the vessel exactly as it appears on the vessel's official papers. The former name shall be included on the first certificate issued after the vessel changes name as "Ex: ____".

(3) Official Number. For U.S. vessels, the official number if documented; a hyphen or state number if undocumented. For foreign vessels, the country of registry and call sign.

(4) Class. Passenger, freight, tankship, research, ferry, towing, passenger barge, hopper dredge, oceanographic, salvage, MODU, etc. This designation shall be preceded by the word "Foreign" when the certificate is issued to a foreign vessel. In the case of integrated tug-barges, enter the class (e.g., Towing/ITB).

(5) Tons. Gross and net tons as they appear on the vessel's official documents. In the case of undocumented vessels, the tonnage as determined by other means or insert a hyphen.

(6) Length. For documented vessels, the registered length; for undocumented vessels, the length as determined by other means. For motorboats, the length as measured in accordance with the Federal Motorboat Act of 1940, as amended; "(M/B)" shall be entered after the length.

(7) Home Port. As stated in the vessel's official papers. In the case of undocumented vessels, other than public vessels, the port from which the vessel normally operates shall be entered. For public vessels, "Public Vessel."

(8) Year Built. The year the construction of the vessel was completed.

(9) Place Built. The city and state in which the final construction was completed.

(10) Year Rebuilt. The date shall be entered here when the vessel is rebuilt to the point that the vessel, in all respects, meets the regulations applicable to new vessels; otherwise, a hyphen.

(11) Hull Constructed Of. State whether steel, wood, aluminum, etc., was used. When high-tensile steels are used, an asterisk shall be placed by the entry "steel" and an appropriate notation made in the space entitled "Route permitted and conditions of operation." For example: "High Tensile Steels--special welding procedures required. See approved plans." On vessels having a construction portfolio, reference should be made to the portfolio in lieu of to approved plans.

(12) Operator and Operator's Address. The name and address of the company or persons who are actually operating the vessel, and who are responsible for operating and maintaining the vessel in accordance with the laws and regulations.

(13) Owner and Owner's Address. The name and address as stated in the vessel's official or legal papers.

(14) Inspection . . . Completed At. The port at which the OCMI who completed the inspection is located. However, when the inspection is conducted at a port away from the immediate area of the office but within the same zone, the name of that port may be entered. For example, for a vessel inspected at Cambridge, Maryland by personnel from MSO Baltimore, the entry may be "Inspection having been completed at Cambridge, Maryland . . ."

(15) Manning.

(a) Indicate in the manning table the crew required for a 24-hour operation. When reduced crews are authorized for less than a 24-hour operation, such crew requirements shall be entered as an endorsement under "Route permitted and conditions of operation" stating "when operating not more than 12 hours in any 24-hour period, the vessel may be operated with . . ."

(b) When a reduced manning level has been approved by Commandant (G-MVP) and such reduction was predicated to any degree on the installation of automated control/monitoring systems, one or both of the following notations, as applicable, shall appear under "Routes permitted and conditions of operation":

(1) "The elimination of (firemen)(watertenders)(firemen/watertenders) is contingent upon the proper automated operation of the boiler management system. Any alterations to or failure of the system must be reported to the OCMI at the vessel's first U.S. port of arrival."

(2) "The elimination of watchstanding (QMED's)(licensed engineers) (QMED's and licensed engineers) in the machinery spaces is contingent upon the proper operation of the automated control/monitoring systems. Any alterations to or failure of these systems must be reported to the OCMI at the vessel's first U.S. port of arrival."

(See also section 52-6-1A of this manual.)

(16) Other Persons In The Crew. This entry should be based on the owner's desires, with limitations based on accommodations, vessel's stability, and lifesaving equipment.

(17) Passengers. The total number of passengers permitted. For ferry vessels, enter the word "Ferry" (see paragraph 30-6-10H(4) of this manual).

(18) Industrial or Scientific Personnel. This entry should also be based on the owner's desires with limitations based on accommodations, vessel's stability, and lifesaving equipment. Such entries shall be made in the space provided after the words "crew, and" and in front of the words "Total persons allowed . . ."

(19) Total Persons Allowed. Include passengers, all crewmembers, and other persons permitted. On certificates for ferry vessels, enter the word "Ferry."

(20) Route Permitted and Conditions of Operation. The major route designation (oceans; coastwise; Great Lakes; lakes, bays, and sounds; or rivers). Further limitations imposed or extensions granted shall also be described by bodies of water, geographical points, distances from geographical points, distances from land, etc. Any conditions of operation imposed pertaining to length of run, daylight operation, etc. should be included. For vessels on international voyages, the call sign and deadweight tonnage shall be entered in this space, as follows:

"CS-_____, DWT-_____."

(21) Lifesaving Equipment Provided For. The number of persons for which lifesaving equipment is provided will normally be the same as the total persons carried. However, for ferry vessels, this figure should be the same as the number of adult life preservers required.

(22) Primary Lifesaving Equipment. The number of lifeboats (boats and/or survival capsules), workboats, inflatable liferafts, life floats, and buoyant apparatus which, in fact, are provided. Enter also the total number of persons which these pieces of equipment can accommodate, as determined by the nameplates on the equipment.

(23) Ring Life Buoys. The minimum number required; the number with lines attached and the number of waterlights need not be entered.

(24) Rescue Boats. The number of rescue boats only; the capacity need not be included. A lifeboat suitable for rescue purposes shall be listed as a lifeboat (Note: The rescue boat shall also be listed on Form CG-840AA - Hull Inspection Book, List of Equipment, under the section for "Lifeboats and Workboats").

(25) Life Preservers. The minimum number required by the applicable regulations.

(26) Stability Letter Issued. The complete date (day, month, and year) and whether permanent "P" or temporary "T."

(27) Drydocked and Tail Shaft Drawn. The month and year last drydocked or the tail shaft examined or drawn for credit. On vessels having two or more tail shafts for which the latest inspections occurred within 30 days of each other, the date of the latest examination/drawing for credit shall be entered. On mobile offshore drilling units (MODU's) which receive a special examination in lieu of drydocking, enter the month and year and the words "special examination."

(28) Propulsion. The type of propulsion, such as St. Turbo. Red. (steam turbine, reduction gear), St. Turbo. Elect., Diesel, Diesel Elect., Gasoline, etc.

(29) Shaft H.P. The horsepower as stated in the machinery manufacturer's handbook or plans. Horsepower of a vessel is the maximum collective H.P. deliverable to a shaft or shafts (excepting double-ended vessels on which only one end shall be considered).

(30) Fuel. Gasoline, coal, oil, diesel, etc. For vessels using a different fuel for auxiliaries, enter this different fuel in parentheses after the main propulsion fuel. For example, an oil-burning steam vessel with diesel auxiliaries would read "Fuel-Oil (Aux. Diesel Oil)."

(31) Pressure Vessels Examined. Those pressure vessels required to be internally examined or hydrostatically tested in accordance with 46 CFR 61.10-5(b) and (d), and the month and year when the examination or test was completed. Use the same date for all pressure vessels when the dates fall within 30 days of each other.

The following abbreviations can be used:

AR -- Air Receiver
EVAP -- Evaporator (LP or HP)
DC/H -- D.C. Heater
CT -- Cargo Tanks
IS -- Industrial Systems (MODU)

Other pressure vessels may be entered, if desired, in the blank space under "Maximum Steam Pressure Allowed" (see item (38) below).

(32) Boilers. The word "Main" or "Aux." as appropriate.

(a) Records At. The MSO/MIO at which the boiler data records are held. This entry should never change unless the vessel is reboilered at another port.

(b) Number. The number of boilers.

(c) Year Built, Type, and Mfr. The type of boilers, such as watertube or fire-tube, and other appropriate data.

(d) Mountings and Hydrostatic Tests. The month and year when examinations and/or tests were completed. When two or more boilers are involved, entries shall be for the latest date whenever the dates fall within 30 days of each other.

(e) Maximum Steam Pressure Allowed. The maximum steam pressure allowed as indicated on the boiler data plate.

(33) (blank space) The blank space provided under "Maximum Steam Pressure Allowed" may be used to indicate engineering data required for vessels having more equipment installed than there is space provided for elsewhere on the certificate. If this is not sufficient space, an asterisk shall be inserted and the information shall be placed in the "Route permitted and conditions of operation" section of the certificate.

(34) Fire Protection Equipment.

(a) Fixed Systems. Enter the type (CO2, steam, etc.) and the space protected as follows:

FR -- Fireroom
CH -- Cargo hold
CT -- Cargo tank
PL -- Paint and lamp room
FT -- Fuel tank or space
EG -- Emergency generator space
ER -- Engine room
-- Others as appropriate

(b) Semiportable. Enter the minimum number required, class, size, and space protected. For example: 1-BIV-FR.

(c) Portable. Enter the minimum number required and the required class. For example: 2-BII.

(d) Fire Hose. Enter the minimum total length required.

(e) Fire Axes ard Fire Pumps. Enter the minimum number required.

(35) Inspected And Approved For The Carriage Of. The Grade(s) permitted to be carried. For example, "A; E dp. tks." indicates that Grade A or below may be carried in all but the deep tanks, which are restricted to Grade E. Do not repeat the regulations in 46 CFR 32.60-35.

(36) Capacity. The capacity of all integral cargo tanks shall be entered in barrels.

(37) Periodic Reinspections. The date and zone of each reinspection conducted as required by the applicable regulations. Entries in this section of the certificate shall be made in ink and signed by the inspector conducting the reinspection.

(38) MSC Vessels. In addition to the entries generally required on the COI, the following entries shall be made for Military Sealift Command (MSC) vessels which are certificated by the Coast Guard:

(a) At the end of the statement "I hereby certify . . .", an asterisk shall be inserted near the word "thereunder," and in the blank space for "Route permitted and conditions of operation", there shall be inserted an asterisk and the words "In accordance with the standards applicable to MSC vessels."

(b) In the space provided on the Certificate of Inspection for the word "Class," insert two asterisks and the class as indicated in item (4) above. Beneath the note inserted in accordance with item (a) above, insert two asterisks and add the words "Naval (transport, cargo, tankship, oceanographic, or salvage, as appropriate) vessel, in service, civilian manned" (e.g., "Naval tankship, in service, civilian manned").

Note: The term "in service" refers to those MSC vessels which are manned by civil service or merchant marine crews, as opposed to those MSC vessels which are manned by naval crews and termed "in commission."

(c) In the space noted for Industrial or Scientific Personnel, an appropriate entry shall be made on the COI for certain MSC vessels which carry persons connected with the business of the vessel but not properly classed as crew or passengers. Such persons may constitute the military staff on MSC transports or fleet support vessels, technicians and scientists on oceanographic vessels, military guards on certain MSC cargo vessels, etc. Such personnel shall be reflected in the total persons allowed.

48-2-5C. CERTIFICATE ENDORSEMENTS

(1) Endorsements concerning hours of duty need not be entered, except where reduced crews are authorized, since most merely repeat a law or regulation, except in cases where endorsement is required by 46 U.S.C. 222. Endorsements required by 46 CFR 36.01-5, 38.01-5, 39.01-5, and/or 40.05-2 shall be made as required.

(2) Manning requirements for vessels towing inspected passenger barges shall be indicated on the COI issued to the barge as required by subpart 52-6-40 of this manual.

(3) All certificates for U.S.-certificated tankships shall be endorsed as follows:

"Cargoes which when mixed with each other react in a hazardous manner must be separated from each other by a cofferdam, empty tank, or mutually compatible cargo. Such cargoes shall not be carried in tanks having a common piping or venting system."

48-2-5D. CREW REQUIREMENTS

(1) Dayworking personnel in both the deck and engineering departments have become integral parts of the manning level prescribed for automated vessels. Their departmental affiliation shall be noted (e.g., 3 Deck Maintenance Men, 3 Oilers, etc.), with the statement "may be permitted to serve in a dayworking capacity" (see paragraph (2) below for liquefied gas vessels). This action accomplishes the following:

(a) Avoids conflict with 46 U.S.C. 673, which precludes deck personnel from serving in the engineering department (and vice versa) and from being required to stand a three-watch system.

(b) Allows the master and chief engineer a degree of latitude in exercising their prerogative in determining the ship's internal organization; and

(c) Minimizes the possibility of becoming directly involved in labor-management contractual matters.

(2) The exception to paragraph (1) is that the COI for liquefied gas vessels shall clearly indicate that the cargo officer and cargo systems engineer be non-watchstanders. A notation shall be made under the "Routes permitted and conditions of operation" section that "The Chief Mate shall be designated the cargo officer and be non-watchstanding" and "The First or Second Assistant Engineer shall be designated the cargo systems engineer and be non-watchstanding." Either the first or second assistant engineer shall be designated by the OCMI as the cargo systems engineer.

(3) Watchmen shall be listed separately in the space under "Deckhands."

(4) Either of the Firemen/Watertenders designations may be lined out when only the other rating is required.

(5) The practice of requiring certificated engineering personnel on the certificates of river vessels and other vessels exempted from this requirement by 46 U.S.C. 643 shall be discontinued. For these cases, after the designation "Oilers," etc., enter the letters "NC" to indicate that these persons are not required to possess a QMED Certificate or a Merchant Mariner's Document.

(6) By law, the Coast Guard is required to state on the vessel's certificate the minimum complement of licensed and certificated personnel necessary for the safe navigation of the vessel. This requirement shall be strictly complied with. The practice of requiring junior engineers, junior watch officers, etc., on a certificate is discouraged. However, if the owner, operator, agent, or master of an automated or partially automated vessel requests that the manning of the vessel include a deck engine mechanic or engineman, the certificate shall carry the requirement as "Oilers" and a notation made under "Routes permitted and conditions of operation" that "Junior engineers, deck engine mechanics, or enginemen may be substituted for one or more oilers."

(7) The setting of watches shall not be done on the certificate.

(8) Endorsements relating to radar observers are not considered necessary or desirable, except on certificates for hydrofoils or air cushion vehicles (see subpart 52-6-50). The regulatory requirements are considered to be clear without requiring special notations (other than as noted) on the COI.

48-2-10. T-BOAT CERTIFICATE OF INSPECTION, FORM CG-3753

48-2-10A. USE, COPIES REQUIRED, AND DISTRIBUTION

Form CG-3753 shall be used for all vessels inspected under the regulations in 46 CFR 175-187, Subchapter T (Small Passenger Vessels (Under 100 GT)). Distribution shall be the same as for Form CG-841 (see section 48-2-5A of this manual). Additional copies may be obtained by the owner of an inspected vessel or his authorized agent upon proper application to the issuing OCMI.

48-2-10B. CERTIFICATE ENTRIES

The following items shall be entered on the COI, subject to certain stipulations:

(1) Date Certificate Expires. "S" vessel certificates shall expire three years from date of completion of the inspection for certification, and "L" vessel certificates shall expire one year from the date of completion (see 46 CFR 175.05-5 for "S" and "L" designations).

(2) Vessel. The name of the vessel exactly as it appears on the vessel's official papers. If the vessel is undocumented, enter the name as stated by the owner. If the vessel has no name, enter a hyphen. Do not use the entry "No Name" unless the boat is so named. The former name shall also be included on the first certificate issued after a vessel changes name as "Ex: _____."

(3) Official or State Number. If the vessel has no number, enter a hyphen.

(4) Service (Use). "Passenger" or "Ferry." In addition, if the vessel is mechanically propelled, of over 15 gross tons, and carries freight for hire, the word "Freight" shall be entered after passenger or ferry.

(5) Length. As determined in accordance with the regulations in 46 CFR Subchapter T.

(6) Tons (Gross and Net). As they appear in the vessel's documents, rounded off to the nearest whole number. If under 5 net tons, enter "under 5 net tons."

(7) Home Port. As stated in the vessel's documents; if the vessel is undocumented, the port of principal operation.

(8) Owner's Name and Address. As stated in the vessel's documents when available; otherwise, as stated by the owner.

(9) Year Built and Place Built. As stated in the vessel's documents, office records, previous certificates; or, in the absence of this information, as stated by the owner.

(10) Construction. Steel, wood, or other material used in the construction of the hull.

(11) Operator's Name and Address. The name(s) and address of the company or persons who are actually operating the vessel, and who are responsible for operating and maintaining the vessel in accordance with the applicable laws and regulations.

(12) Maximum Passengers Allowed. If the service of the vessel is such that children are never carried, the notation "adults only" shall be inserted.

(13) Total Persons Allowed. (Passengers plus crew plus any other persons); when alternate crews are carried, the total persons allowed shall not be exceeded.

(14) Required Crew.

(a) Enter minimum required crew as determined by the OCMI. Additional crew permitted may also be entered in this space if the entry clearly shows that they are optional;

(b) Indicate the crew required for a 24-hour operation. When reduced crews are authorized for less than a 24-hour operation, such reduced crew requirements shall be indicated in an endorsement under "Route permitted and conditions of operation" stating "when operating not more than 12 hours in any 24-hour period, vessel may be operated with ____."

(c) A vessel that operates 24 hours a day and does not return to port to obtain an alternate crew must carry a double crew and be equipped with sufficient total lifesaving equipment.

(15) Lifefloats. The total number of lifefloats carried and the total capacity in persons.

(16) Buoyant Apparatus. The total number of buoyant apparatus carried and the total capacity in persons.

(17) Life Preservers for Adults. The minimum number required; Do not enter any excess life preservers which may be carried.

(18) Life Preservers for Children. The minimum number required; Do not enter any excess life preservers for children which may be carried. If the certificate indicates that children are never carried, enter a hyphen.

(19) Ring Buoys. The minimum number required by Subchapter T.

(20) Rescue Boat(s). The number of rescue boats only; the capacity need not be included.

(21) Other Lifesaving Equipment. The number, type, and capacity of other primary lifesaving equipment carried onboard the vessel, such as lifeboats, inflatable liferafts, and ring life buoys, when they are a substitute for primary lifesaving equipment required under the provisions of 46 CFR 180.10-30(d).

(22) Portable Fire Extinguishers. The number, type, and size of portable fire extinguishers required (2-B-I, 1-B-II, etc.), and information for semi-portable extinguishers permitted as equivalents. Do not enter excess fire extinguishers.

(23) Fixed System. The medium, capacity, and space protected; if no fixed system is installed, enter a hyphen.

(24) Axes, Pumps, and Hoses (Length). The number of fire axes and fire pumps, and the total length of firehose, required by Subchapter T.

(25) Date Stability Letter Issued. The date and zone when issued and whether permanent ("P") or temporary ("T"). If not applicable, enter a hyphen.

(26) Last Drydocked. The date (month and year).

(27) Pressure Vessels Examined. The month and year when the pressure vessel examination(s) or test(s) was completed. If not applicable, enter a hyphen.

(28) Propulsion, H.P., and Fuel. For propulsion, enter motor, sail, non-self-propelled, or other means; for H.P., enter the total horsepower of all engines as indicated by the nameplate or engine manufacturer; for fuel, enter gasoline, diesel, or other.

(29) Route Permitted and Conditions of Operation. First, state the major route designation (ocean, coastwise, Great Lakes, lakes/bays and sounds, or rivers). Further limitations imposed or extensions granted shall also be described by bodies of water, geographical points, distances from geographical points, distances from land, etc. Enter any conditions of operation imposed pertaining to length of run, daylight operation, etc. (Note: When a small passenger vessel's route extends into another OCMI's zone, the certificating OCMI shall send a copy of the certificate to the OCMI in the other zone.

(30) Periodic Reinspections. The date and zone of each reinspection; Entries in this space shall be made and signed in ink by the inspector conducting the reinspection.

48-2-15. BARGE CERTIFICATE OF INSPECTION, FORM CG-4678

48-2-15A. USE, COPIES REQUIRED, AND DISTRIBUTION

Form CG-4678 shall be issued for all barges inspected under 46 CFR 30-40, Subchapter D (Tank Vessels); 46 CFR 90-105, Subchapter I (Cargo and Miscellaneous Vessels); and 46 CFR 150-154, Subchapter O (Certain Bulk Dangerous Cargoes). The certificate shall be prepared with sufficient copies to make the same distribution as Form CG-841 (see section 48-2-5A). If deemed appropriate, the OCMI may use Form CG-841 for large, manned barges.

48-2-15B. CERTIFICATE ENTRIES

(1) Date Certificate Expires. Two years from the date of completion of the biennial inspection.

(2) Vessel. The name of the vessel exactly as it appears on the vessel's documents. The former name shall also be included on the first certificate issued after the vessel changes name, as "Ex: _______".

(3) Official Number. If documented, enter the official number; if undocumented or formerly documented, enter a hyphen and the state number or the Coast Guard number, as applicable.

(4) Service. Tank Barge, Seagoing Barge (Scow, Crane, Freight, Dredge, etc.), as applicable (e.g., Seagoing Barge/Scow). For barges certificated to carry cargoes listed in 46 CFR Table 151.01-10(b), the designations "O & D" or "O & I" shall be placed after the term "Tank Barge" to indicate the subchapters under which the vessel was inspected and certificated. In the case of integrated tug-barges, enter ITB after the service (e.g., Tank Barge/O&D/ITB, Freight/ITB, etc.).

(5) Hull Type. The type of material used in construction (steel, aluminum, etc.); enter the hull type, if applicable (e.g., "Steel-II."). If the barge has a double hull, sides, or bottom, enter an asterisk and add an appropriate description in the space provided for "Route permitted and conditions of operation."

(6) Tons and Length. For documented vessels, enter the registered tons and length. For undocumented vessels, enter the estimated tons and length as determined by other means.

(7) Date and Place Built. The city and state in which the final construction was completed. The date shall be the year in which construction was completed.

(8) Home Port. The name as stated in the vessel's official papers. In the case of undocumented vessels, other than public vessels, the port from which the vessel normally operates shall be entered. For public vessels, enter the words "Public Vessel."

(9) Owner. The name(s) and address as stated in the vessel's official or legal papers.

(10) Operator. The name(s) and address of the company or person(s) who are actually operating the vessel in accordance with the applicable laws and regulations. When the owner and operator are the same, the entry need only be "Owner."

(11) Required Crew. Indicate the crew required for the safe navigation of the vessel. When a crew is not required or permitted, enter the word "Unmanned." When a permissive crew is permitted under conditions of operation, enter a hyphen only in this space (see section 48-2-15C below.).

(12) Lifesaving Equipment. Enter only the lifesaving equipment required. For unmanned barges, enter a hyphen.

(13) Fire Protection Equipment. The fire protection equipment required only. For portable extinguishers, indicate the number of units, class, and size (1-B-II, etc.). For fixed systems, indicate the size and medium (15 lb. CO_2-Fixed). Also, enter a cargo transfer and machinery operation clause, if applicable.

(14) Route Permitted and Conditions of Operation.

(a) State the major route designation, followed by any additional limitations imposed.

(b) For barges carrying cargoes regulated by Subchapter O, list the maximum cargo weight in short tons, maximum density in pounds per gallon, or the limiting draft for the barge.

(15) Inspection Data. List all integral and independent cargo tanks and the month and year of the most recent examinations and tests. When several cargo tanks have identical examination and test dates, they may be listed in the same column. Example:

Cargo Tanks: 1, 2, 3;
Internal Exam.: 12-78.

Changes to inspection data between certificates shall be made by a Certificate of Inspection Amendment, Form CG-858 (see subpart 48-2-25 below).

(16) Date Drydocked. The month and year last drydocked for credit. If an internal examination is conducted in lieu of drydocking, it shall be so stated (e.g., "Int. Exam. in lieu of drydocking, December 1978").

(17) Pressure Vessels. List each pressure vessel and the month and year of last examination or test.

(18) Auxiliary Machinery. Such machinery as auxiliary boilers, cargo pumps, refrigeration machinery, etc. Example:

1-Cargo Pump (Diesel);
1-25# Heating Boiler (B & W);
Hydro. 12-78;
MT. opened 12-78;
MT. removed 12-78;

(19) Capacity. The total cargo capacity in either barrels or short tons and/or by draft.

(20) Inspected And Approved For The Carriage Of:

(a) Enter the applicable grade(s) permitted, the conditions of carriage of elevated temperature cargoes (46 CFR 36.01-5), liquefied flammable gases (38.01-5), certain dangerous cargoes (40.05-2), or the names of cargoes permitted by Subchapter O. List the loading restrictions for Subchapter O cargoes when required.

(b) All COI's for barges not in dedicated service, inspected for the carriage of Subchapter O cargoes, shall be endorsed as follows:

"Cargoes which when mixed with each other react in a hazardous manner must be separated from each other by a cofferdam, empty tank, or mutually compatible cargo. Such cargoes shall not be carried in tanks having a common piping or venting system."

(c) When additional space is required, an asterisk can be inserted in the "Route permitted and conditions of operation" section or the "Inspected and approved for the carriage of" section of the certificate. If these spaces are insufficient, entries may be made on a Certificate of Inspection Amendment (Form CG-858). In these cases, the COI shall reference the amendment.

(21) Mid-Period. The date and zone after the mid-period reinspection is completed. Entries shall be made in ink and signed by the inspector conducting the re-inspection.

48-2-15C. CERTIFICATE ENDORSEMENTS

(1) For those unmanned barges on which the owner or operator desires to carry a crew, the permissive crew shall be indicated in an endorsement under "Route permitted and conditions of operation" indicating the number of and qualifications for the permissive crew (see section 52-6-45A of this manual concerning permissive manning).

(2) An endorsement for a watchman on tank barges need not be made because it merely repeats a regulation. Watchmen shall be included in the crew requirements.

(3) The practice of requiring certificated engineering personnel on the certificate for river barges and other barges exempted from this requirement by 46 U.S.C. 643 (R.S. 4551) shall be discontinued. For these vessels, after the designation "oilers," etc., enter the letters "NC" to indicate that these persons are not required to possess a QMED Certificate or a U.S. Merchant Mariner's Document.

(4) Endorsements for the carriage of deck cargo on tank barges are not necessary.

(5) Endorsements for the carriage of vehicles on tank barges may be stated as:

"Permitted to carry vehicles - total wt. 18,000 lbs. per unit; axle load 6,000 lbs. per axle. Vehicles are not permitted to be operated."

48-2-20. TEMPORARY CERTIFICATE OF INSPECTION, FORM CG-854

Form CG-854, authorized by 46 U.S.C. 399, is intended to be issued only for the purpose of permitting the immediate operation of a vessel after completion of the inspection and prior to delivery to the vessel of the appropriate COI (Form CG-841, CG-3753, or CG-4678). When a Temporary COI is issued to a vessel inspected under Subchapter T, the words "Section 390" should be substituted for the words "Section 399" in the first paragraph of the Temporary Certificate.

Under no circumstances shall a Temporary Certificate of Inspection be issued to a vessel which does not qualify for a Certificate of Inspection.

48-2-25. CERTIFICATE OF INSPECTION AMENDMENT, FORM CG-858

Form CG-858 shall be completed and distributed in the same manner as a COI Form CG-841 (see section 48-2-5A above) when changes in the character of the vessel, route, equipment, etc., occur after the issuance of the certificate. When issuing a COI, an Form CG-858 may be used for additional entries on the certificate when all available space on the COI itself has been utilized.

48-2-30. APPLICATION FOR WAIVER AND WAIVER ORDER, FORM CG-2633

Form CG-2633 is self-explanatory and shall be completed as indicated on the form itself. Copies of waivers issued shall be forwarded to Commandant (G-MVI) or Commandant (G-MVP) as required by the subject matter. When the waiver is referred to the Commandant for action, a forwarding letter explaining the circumstances of the case shall accompany the form, unless there are reasons dictating more appropriate procedures.

48-2-35. PERMIT TO PROCEED TO ANOTHER PORT FOR REPAIRS, FORM CG-948

The OCMI, whenever granting permission for a vessel to proceed to another port for repairs, shall use Form CG-948 (see subpart 30-13-5 of this manual).

48-2-40. PERMIT TO CARRY EXCURSION PARTY, FORM CG-949.

Form CG-949 shall be used by the OCMI when granting permission for a vessel to engage in a temporary excursion operation not permitted by a vessel's COI. Such is the case when a passenger vessel is permitted to carry extra passengers or operate on an extended route, or when a cargo or miscellaneous vessel is permitted to carry recreation parties on a one-day basis. The permit shall be issued for a limited period of time only, and during its tenure shall be considered as a temporary supplement to the Certificate of Inspection. The word "temporary" is stressed. An Excursion Permit shall not be used as a device to circumvent complete inspection requirements.

Form CG-949 shall be executed in triplicate. The original copy shall be issued directly to the master, operator, owner, or agent of the vessel; one copy shall be forwarded to Commandant (G-MVI) via the appropriate district commander (m); and one copy retained by the OCMI. Additional copies may be obtained by the master, operator, owner, or agent of the vessel upon proper request to the issuing OCMI.

48-2-45. EXEMPTION CERTIFICATE, FORM CGHQ-967

The Commandant issues Form CGHQ-967 to vessels exempted from specific requirements of the International Convention for Safety of Life at Sea (SOLAS) (see subpart 30-9-10 of this manual). The Exemption Certificate is issued in conjunction with either a Passenger Ship Safety Certificate (Form CGHQ-968) or a Cargo Ship Safety Equipment Certificate (Form CG-3347). The completed Exemption Certificate is sent to the OCMI having jurisdiction, and distribution is the same as for the Certificate of Inspection, Form CG-841 (see section 48-2-5A above).

48-2-50. PASSENGER SHIP SAFETY CERTIFICATE, FORM CGHQ-968

The Commandant issues Form CGHQ-968 to passenger vessels which comply with the applicable requirements of the SOLAS Convention (see subpart 30-9-10 of this manual). The completed certificate is sent to the OCMI having jurisdiction, and distribution is the same as for COI Form CG-841 (see section 48-2-5A).

48-2-55. NOTIFICATION OF APPROVAL FOR PASSENGER SHIP SAFETY CERTIFICATE, FORM CG-969A

The OCMI, upon completion of the inspection for certification, shall submit a report on Form CG-969A to Commandant (G-MVI). This form should normally be accompanied by FCC Form 806. Except for primary lifesaving equipment, only the equipment that is required by SOLAS shall be entered on Form CG-969A.

48-2-60. CARGO SHIP SAFETY EQUIPMENT CERTIFICATE, FORM CG-3347

The OCMI having jurisdiction issues a Form CG-3347 to cargo and tankships of 500 G.T. or more which comply with the applicable provisions of the SOLAS Convention (see subpart 30-9-10 of this manual). Distribution shall be the same as for COI Form CG-841 (see section 48-2-5A above).

Except for primary lifesaving equipment, only the equipment that is required by SOLAS and which is on board shall be entered on the Cargo Ship Safety Equipment Certificate. Equipment which is required by SOLAS but not actually on board shall be omitted from the certificate. A number indicating the actual amount of equipment on board shall be shown on the form; a zero shall be used if none of the required equipment is on board. SOLAS certificates shall not contain asterisks or notes indicating requirements or shortages. An Exemption Certificate (Form CGHQ-967) is necessary when authorized shortages exist (see subpart 48-2-25 above).

The COI Form CG-841, Cargo Ship Safety Equipment Certificate (Form CG-3347), and Cargo Ship Safety Construction Certificate (Form CG-4359) or ABS Form SLC 5-60 shall be submitted to Commandant (G-MVI) under one cover to facilitate review.

48-2-65. CONTROL VERIFICATION FOR FOREIGN VESSEL, FORM CG-4504

Upon satisfactory completion of an examination, the OCMI may issue a Form CG-4504 to vessels registered in countries which are parties to the SOLAS Convention and carrying persons in addition to crew from U.S. ports, or to vessels of countries with which the United States has reciprocal inspection agreements (see Chapter 32 of this manual for a full discussion on the inspection and examination of foreign vessels). This form shall be distributed in the same manner as Form CG-841 (see section 48-2-5A above).

48-2-70. CERTIFICATION OF VESSEL AS SAFE TO CARRY DRY AND PERISHABLE CARGO, FORM CG-4333

Subpart 30-13-25 of this manual provides for the examination of uninspected vessels at the request of Coast Guard documentation officers and the certification of these vessels as safe to carry dry and perishable cargo. For internal administrative purposes, Form CG-4333 shall be used for this purpose; a copy shall be retained on file by the OCMI making such inspections. Form CG-4333 is self-explanatory and is not required to be forwarded to the Commandant.

48-2-75. IMCO CERTIFICATES OF FITNESS

48-2-75A. GENERAL

On 4 October 1976, the Coast Guard published proposed regulations for self-propelled vessels carrying bulk liquefied gases. On 26 September 1977, the final regulations (46 CFR 153) for the carriage of bulk dangerous or extremely flammable liquid cargoes by self-propelled vessels were published. These sets of regulations implement the IMCO Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, IMCO Resolution A 328 (IX) and the IMCO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, respectively. Each of these IMCO Codes has provisions for the issuance of the Certificates of Fitness to vessels indicating their compliance with the codes.

There are some vessels which, due to their date of construction, are not subject to the IMCO Gas Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Section 1.2 of the IMCO Code). IMCO adopted Resolution A 329 (IX) on 12 November 1975, which recommended that gas ships delivered after 31 October 1976 but prior to the application of the IMCO Gas Code (Resolution A 328 (IX)) be regarded in accordance with the provisions of the code to the extent reasonable and practical. Moreover, it was recommended that these vessels be issued an IMCO Gas Code Certificate of Fitness with an endorsement listing the specific provisions of Resolution A 328 (IX) with which they do not comply.

Upon request, a vessel complying with either set of regulations shall be issued the appropriate IMCO Certificate of Fitness (Form CG-5148 or CG-5148A) in conjunction with the COI and appropriate SOLAS documents. Those gas ships which are not subject to the IMCO Gas Code (Resolution A 328 (IX)) will have an annex to their Certificate of Fitness listing those provisions of the IMCO Gas Code with which they do not comply.

District commanders and unit commanding officers shall ensure that the following provisions are complied with.

48-2-75B. CERTIFICATE OF FITNESS FOR THE CARRIAGE OF LIQUEFIED GASES IN BULK, FORM CG-5148.

48-2-75B(1). Issuance. The OCMI having jurisdiction, upon request from the master, owner, or agent of the vessel, shall issue a Form CG-5148 to tank vessels which comply with the applicable provisions of Resolution A 328 (IX).

Annex 4A of the Certificate of Fitness (Form CG-5148) shall be used to list those areas of the IMCO Gas Code with which a vessel does not comply, and shall be attached to the Certificates of Fitness of vessels to which the IMCO Gas Code does not apply.

The certificate shall be issued for a period not to exceed two years and shall be dated to expire at the same time as the vessel's COI and Cargo Ship Safety Equipment Certificate.

48-2-75B(2). Certificate Entries. Many of the entries on Form CG-5148 concern data developed during the technical review process. Commandant (G-MMT) and the district commander (mmt) involved in the review process shall tabulate the data required for the Certificate of Fitness as it is developed and forward it to the cognizant OCMI. This will preclude lengthy file searching when the vessel is ready to be certificated.

48-2-75B(3). Copies Required and Distribution. Form CG-5148 shall be prepared with sufficient copies for the following distribution:

(a) Original -- Issued directly to the master, owner, or agent of the vessel.
(b) 2 Copies -- To Commandant (G-MVI) via the district commander (m).
(c) 1 Copy -- Issuing OCMI's file copy.
(d) 1 Copy -- To owner or agent of the vessel (if requested).

48-2-75B(4). Availability of Forms. Form CG-5148 can be ordered from Supply Center Brooklyn using stock number 7530-01-6F2-8660.

48-2-75C. CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK, FORM CG-5148A

48-2-75C(1). Issuance. The OCMI having jurisdiction, upon request from the master, owner, or agent of the vessel, shall issue a Form CG-5148A to tank vessels which comply with the applicable provisions of the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, IMCO Resolution A 212 (VII). The certificate shall be issued for a period not to exceed two years and shall be dated to expire at the same time as the vessel's COI and Cargo Ship Safety Equipment Certificate.

48-2-75C(2). Entries. Some of the entries on Form CG-5148A concern data developed during the technical review process. Commandant (G-MMT) and or the district commander (mmt) involved in the review process shall tabulate the data required for the Certificate of Fitness as it is developed and forward it to the cognizant OCMI.

48-2-75C(3). Copies Required and Distribution. The number of copies required and the distribution of form CG- 5148A are the same as for Form CG-5148.

48-2-75C(4). Availability of Forms. Form CG-5148A can be ordered from Supply Center Brooklyn using stock number 7530-01-GF2-8670.

48-2-80. VESSEL INSPECTION RECORD, FORM CG-2832

48-2-80A. PURPOSE

The purpose of Form CG-2832 is to provide the marine inspector with readily available information as to the inspection status of a specific inspected vessel when the vessel is boarded.

The establishment of the Vessel Inspection Record in no way diminishes the responsibility or discretion of any OCMI with respect to the type or frequency of inspections. Rather, it is intended to provide such officers with information as to the inspection status of vessels so that they can better determine the need for further inspections. The form shall be installed and maintained by Coast Guard inspectors only, but it may be examined at any time by the master, owner, agent, etc., of the vessel.

The Vessel Inspection Record form shall be installed and maintained on ocean and coastwise freight vessels, including tank vessels, of 500 G.T. or more, and ocean and coastwise passenger vessels of any gross tons, except passenger vessels inspected under Subchapter T. The record shall be kept in the pilothouse.

48-2-80B. ENTRIES

(1) General. At the conclusion of each inspection, the inspector shall make an appropriate entry on Form CG-2832 which will show the type of inspection, pertinent remarks, drills conducted, port, inspector's signature, and date. Each inspector who boards a vessel shall examine this record to learn what inspections have been made and to determine whether any further inspections are necessary. Entries shall be printed in ink and in accordance with the instructions printed on the form and the following paragraphs.

(2) Placement On Vessels and Initial Entries. Upon completion of the inspection for certification, the form shall be filled out by the inspector and installed in the proper container in the pilothouse. When a vessel is permitted to proceed to another port before the inspection is completed, the inspector at the first port shall insert the word "Began" before the type of inspection (e.g., "Began Biennial Inspection"). When an inspector in another port has completed the inspection, he shall make an entry on a new line, inserting the word "Completed" before the type of inspection (e.g., "Completed Biennial Inspection"). Whenever another type of inspection, such as a drydock examination or a lifeboat weight test, is performed during the course of the inspection for certification, only the entry "Annual Inspection" or "Biennial Inspection" shall be made under "Type of Inspection."

(3) Subsequent Inspections. At the completion of each inspection, an entry shall be made on a new line under "Type of Inspection." When two or more distinct subsequent inspections are conducted at the same time, all should be entered on the same line if possible. In the case of continuing inspections involving more than one port, only those portions of the inspections which are completed at a port shall be entered. Mere visits made during the course of an inspection should not be entered.

(4) Remarks. In this column, the inspector shall enter information which will aid subsequent inspectors in determining the vessel's inspection status. For example, when inspections incidental to repairs are made, a brief entry shall be made indicating the nature of the repairs or alterations. When all of the cargo tanks or cargo holds are not entered and inspected during a biennial inspection of a vessel, the inspector shall list the tanks or holds inspected.

Upon drydock examinations, those sea valves opened and inspected shall be indicated. In addition, whenever a vessel is permitted to sail with outstanding deficiencies after any type of inspection, an entry shall be made to inform subsequent inspectors (e.g., Outstanding Deficiencies: 6 Deck and 3 Eng.).

(5) Drills. The two columns for drills shall be checked in the case of every entry, even when the type of inspection entered is defined as including one or both drills. When a fire and/or boat drill is held entirely independent of any other type of inspection, the inspector shall enter drills in the first column and make appropriate entries in the other columns accordingly.

(6) Port, Signature, and Date. The port, signature of the inspector, and date shall be entered. Only the inspector making the entry shall sign the card, even when two or more inspectors participate in the total inspection.

(7) Transferred Information. Whenever lifeboat weight tests are not conducted at the time that a new card is posted, the date of the last weight test(s)(same date as last inspection for certification if no other entry is noted on the old card) and the name of the inspection port where the test(s) was witnessed shall be transferred to the new Vessel Inspection Record. This transferred information shall be the first entry on the new card and shall be signed by the inspector transferring the entry. In a like manner, when remarks have been entered on the old card concerning cargo tanks, cargo holds, and/or sea valves, and there is no evidence that their status has changed, this information should also be transferred.

(8) Additional Cards Required. Form CG-2832 should reflect all inspections of the vessel. In this regard, it may be necessary to maintain additional Vessel Inspection Record forms in the pilothouse container.

48-2-80C. DISPOSITION OF RECORDS

At the completion of each inspection for certification, the old Vessel Inspection Record(s) may be removed and destroyed or may be placed in the local OCMI's file.

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MARINE SAFETY MANUAL

CHAPTER 49—SUBMERSIBLE VESSELS

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PART 49-1—SUBMERSIBLE VESSELS—GENERAL

▼49-1-1. SUBMERSIBLE VESSEL—DEFINITION

A submersible vessel is a privately owned vessel capable of submerging completely, designed to be manned, and capable of independent powered operations when completely submerged; or is capable of operating while completely submerged, manned or unmanned, while carrying cargo in commerce. These vessels are generally referred to as "submersibles."

Note: The following material in this chapter has been written for reproducing as handouts in response to inquiries.

▼49-1-5. OPERATIONAL REQUIREMENTS FOR SUBMERSIBLE VESSELS

Commandant Instruction 3130.7 (series) describes a voluntary movement reporting system for submersibles operating in or near U.S. waters. These movement (operating) reports are made to the appropriate Coast Guard Rescue Coordination Center (RCC). Inquiries from operators of submersibles concerning the extent of this voluntary movement reporting system should be addressed to the appropriate district commander (osr).

▼49-1-10. UNUSUAL CIRCUMSTANCES INVOLVING SUBMERSIBLE VESSELS

Submersible operations are developing and changing at a rapid pace. Questions which cannot be resolved locally may be referred to Commandant (G-MP-3/USP), U.S. Coast Guard, Washington, D.C. 20590; telephone (202) 426-2307.

PART 49-2—INSPECTED SUBMERSIBLES

▼49-2-1. INSPECTED SUBMERSIBLES—GENERAL

At the present time the Coast Guard does not have design or construction standards which specifically apply to submersibles. However, if the submersible size, propulsion, operation, or nature of cargo is such as to place it in one of the surface vessel inspected classes, then the submersible would be required to be designed, constructed, and operated so as to provide a degree of safety equivalent to that required for surface vessels of the same inspected class. The design of an inspected vessel must be reviewed and evaluated in detail by the Coast Guard; therefore, the originators of a design should contact the nearest officer in charge, marine inspection (OCMI) or commanding officer, marine safety/inspection office for further information on required procedures.

PART 49-3—UNINSPECTED SUBMERSIBLES

▼49-3-1. UNINSPECTED SUBMERSIBLES—GENERAL

Most submersibles in use today do not fall into one of the surface vessel inspected classes and do not require Coast Guard inspection or certification. However, these submersibles are subject to the requirements of title 46 (Shipping) of the Code of Federal Regulations, subchapter C (46 CFR 24–26). The regulations contained in this subchapter cover such items as required lifesaving and fire extinguishing equipment, the display of navigation lights and signals, and the control of hazards associated with gasoline engines. Some of this required equipment may not be suitable for use on small submersibles, and owners or operators of such submersibles may apply to the Commandant of the Coast Guard via the local officer in charge, marine inspection (OCMI) for acceptance of equivalent equipment in accordance with 46 CFR 24.15.

In addition to the above equipment requirements there are certain additional requirements in title 46, subchapter C (46 CFR 24–26) and title 33, subchapter S (33 CFR 173–183) which apply to uninspected submersibles. Several important provisions are worthy of special note. For example, owners or operators of undocumented submersibles with propulsion equipment must have their submersibles numbered in accordance with the Federal or state numbering system in effect for the jurisdiction within which the submersible will be operated. Also, when submersibles are involved in collisions, accidents or other casualties, the operator is required, among other things, to report such occurrences to the appropriate Coast Guard or state authorities. Operators are also required to render such assistance as may be practicable and necessary to other persons affected by the collision, accident, or other casualty in order to save them from danger. Oil pollution prevention regulations (33 CFR 155) and marine sanitation devices (MSD) regulations (33 CFR 159) also apply.

▼49-3-5. RECREATIONAL SUBMERSIBLES AND SUBMERSIBLES CARRYING SIX OR LESS PASSENGERS

Recreational submersibles and submersibles carrying six or less passengers are included within the meaning of the term "boat" as defined by the Federal Boat Safety Act of 1971 (46 U.S.C. 1451, et seq.).

Operators of submersible boats are, therefore, subject to essentially the same requirements (33 CFR 173–183 and 46 CFR 24–26) as operators of boats, particularly when the submersible is on the surface. All submersibles carrying six or less passengers for hire, even though not required to be inspected, must be operated or navigated by a person duly licensed by the Coast Guard. Oil pollution prevention regulations (33 CFR 155) and marine sanitation devices (MSD) regulations (33 CFR 159) also apply.

Manufacturers of submersible boats are also subject to the provisions of the Federal Boat Safety Act of 1971 and the regulations issued thereunder (33 CFR 173–183). Several important provisions are worthy of special note. For example, section 15 of this act and 33 CFR 179 describe how a manufacturer is responsible for notifying first purchasers of any safety defects found and for correction of such defects. In addition, each manufacturer of submersible boats must affix a discrete hull identification number (HIN) to each submersible he builds. Requirements for the HIN are found in 33 CFR 181. The requirements for the HIN is applicable even to the "backyard boat builder," i.e., someone who builds a submersible boat purely for his own recreational use and not for the purpose of sale. However, in this case, the Coast Guard would, upon application of the builder, assign the appropriate HIN for use by the builder.

In addition to the manufacturer requirements above, the Coast Guard is also authorized by the Federal Boat Safety Act of 1971 to prescribe safety standards for the design and performance of boats. These mandatory standards for boats are published as a continuing and comprehensive program of rulemaking that will eventually encompass many types of recreational watercraft. To determine what standards, if any, might apply to a submersible boat, manufacturers should contact Commandant (G-BBT), U. S. Coast Guard, Washington, D. C. 20590. If possible, manufacturers should include all data, plans, and other descriptive information pertinent to the design and performance of the submersible boat.

PART 49–4 COMMERCIAL DIVING EQUIPMENT AND OPERATIONS

49–4–1. INTRODUCTION

A description of the relevant commercial diving activities, regulatory background, Coast Guard jurisdiction and safety concerns, as well as regulatory policy, is provided in part 12–4 (Commercial Diving) of this Manual. The principal thrust of the Coast Guard regulatory effort is to publish safety standards for equipment and operations as regulations in 46 CFR 197, and rely upon voluntary compliance by the industry, supplemented by inspections coincident with other required inspections and investigations. The commercial diving industry's safety record is excellent, and does not provide justification for a more aggressive regulatory posture at this time.

Inspections shall be made of diving equipment or operations when evidence of such activities is present during an inspection of vessels or facilities by the Coast Guard to enforce Coast Guard regulations:

(a) during inspection of vessels required to have a Certificate of Inspection;

(b) during inspection of deepwater ports; and

(c) during the inspection of artificial islands, installations, or devices related to activities on the Outer Continental Shelf.

Inspection personnel shall be familiar with the regulations for commercial diving equipment and operations, contained in 46 CFR 197, and may utilize the inspection check-off list shown in plate 49–4–1.1 as an aid in performing this inspection. More general requirements for inspection procedures and reporting are covered in earlier chapters of this volume, i.e., chapters 30, 31, 33, 36, 37 and 38. Also, the U.S. Navy Diving Manual contains valuable information (NAVSHIPS 0994–001–9010, Volumes 1 and 2).

49–4–5. SUBSTITUTE EQUIPMENT, MATERIALS, PROCEDURES, ETC.

The basic guidelines for Coast Guard acceptance of substitutes for required equipment, materials, apparatus, procedures or tests are contained in 46 CFR 197.206. Approvals required therein should be coordinated with Commandant (G-MVI-4) for service-wide consistency. One-time variances are permitted under 46 CFR 197.202(b) without referral to the Coast Guard.

49–4–10. PRESSURE VESSELS FOR HUMAN OCCUPANCY (PVHO'S)

PVHO'S that have been contracted for or constructed before the effective date of the regulations, 1 February 1979, *and* approved by the Coast Guard need not meet 46 CFR 197.328, 197.330, and/or 197.332.

PVHO'S contracted for or constructed before the effective date *and not* Coast Guard approved must meet requirements of 46 CFR 197.328(b), (c) and (d). The requirements of 46 CFRs 197.330 and 197.332 are in this case mandatory, as applicable.

PVHO'S contracted for or constructed after the effective date must meet requirements of 46 CFR 197.328(a) and (d) and will not receive Coast Guard plan review or approval, shop inspection, etc. Additionally the requirements of 46 CFR 197.330 and 197.332 are mandatory as applicable.

49–4–15. PVHO'S INSPECTION

The inspection of PVHO'S, pressure vessels, and pressure piping systems shall be as follows:

(a) PVHO'S either permanent or temporary installations, *if* Coast Guard – approved under NVIC 2–70, will continue to be inspected in accordance with 46 CFR 50–61 (Subchapter F), so long as they are active in a diving activity. If a PVHO is not in use in a diving activity, its inspection may receive a lower priority as indicated by the cognizant OCMI.

(b) PVHO's *permanently* installed *and* approved under 46 CFR 197, will be treated as above.

(c) PVHO'S *temporarily* installed *and* approved under 46 CFR 197, will be inspected in accordance with 46 CFR 197.462.

(d) All other diving system pressure vessels that are permanently installed will be considered a part of the vessel. Therefore, they are subject to the provisions of Subchapter F.

(e) All other diving system pressure vessels that are temporarily installed will not be considered a part of the vessel. Therefore, those pressure vessels are subject to the provisions of 46 CFR 197.462, except for compressed gas cylinders. If the pressure vessel in question is not specified in this part, it shall remain un-regulated.

(f) Compressed gas cylinders may be accepted for a diving installation so long as they comply with 46 CFR 197.338. In addition, compressed gas cylinders of foreign manufacture may be used if their material condition is satisfactory and there is proof of being hydrostatically tested within the preceding five (5) years. Non-U.S. standards are to be compared to 49 CFR 173.34 and 49 CFR 178 Subpart C to determine their equivalency prior to any blanket acceptance. A copy of these standards and the OCMI's comparative analysis shall be forwarded to Commandant (G-MVI-4). This relaxation in regulation policy is intended to be applied only in areas where U.S. made, DOT cylinders are not reasonably available.

(g) Diving installation piping systems of a permanent type shall be inspected in accordance with Subchapter F. Those of a temporary installation shall be inspected with the diving system's pressure vessels for human occupancy (PVHO'S).

PLATE 49-4-1.1

COMMERCIAL DIVING EQUIPMENT/OPERATIONS CHECKLIST

PART A: GENERAL

Date/Time of Inspection ______________________________

Vessel/Facility Name, Location, Address and Phone:

____

____

____

Owner's Name, Address, Phone Number:

____

____

____

Master's Name, Address, Phone Number:

____

____

____

Operator's Name, Address, Phone Number:

____

____

____

Person-in-Charge: ____________________________
Designated in Writing? ____ Yes ____ No

Diving Supervisor: ___________________________
Designated in Writing? ____ Yes ____ No

PLATE 49-4-1.1 (cont.)

Date of Last Commercial Diving Inspection: ____________________

Responsible Vessel/Facility Personnel Accompanying Coast Guard Inspector(s):

____

____

____

Coast Guard Inspector(s):

____

____

____

PART B: EQUIPMENT YES NO

AIR COMPRESSOR SYSTEM (46 CFR 197.310):

1. Volume Tank Built and Stamped per ASME Code
2. Volume Tank has Check Valve, Pressure Gauge, Relief Valve, Drain Valve
3. Tested Every 12 Months or After Repair, Modification, etc.
4. Intakes Located Away from Fumes/Contaminants
5. Filtration System Efficient
6. Slow-Opening Shut-off Valves if Working Pressure Exceeds 500 psig

BREATHING SUPPLY HOSES (46 CFR 197.312):

7. Maximum Working Pressure Meets Requirement
8. Bursting Pressure Four Times Maximum Working Pressure
9. Connectors Meet Required Standards
10. Kink Resistance Standards Met
11. Hose/Umbilical Length Marked As Required

FIRST AID AND TREATMENT EQUIPMENT AT EACH DIVE LOCATION (46 CFR 197.312):

12. Required Medical Kit
13. American Red Cross Standard First Aid Handbook

PLATE 49-4-1.1 (cont.)

	YES	NO
14. Bag-Type Manual Resuscitator With Transparent Mask and Tubing		
15. Capability to Remove and Injured Diver From Water		
16. Two-Way Communications Standard Met(for Mixed-Gas Diving, Dives to 130 fsw, or Outside No Decompression Limits)		
17. Decompression Chamber		
18. Decompression and Treatment Tables		
19. Breathing Gases Supply for Decompression Sickness		
20. Medical Kit Can be Carried Into Chamber and Used for Hyperbaric Conditions		
21. Capability to Assist Injured Diver Into Decompression Chamber		

GAUGES AND TIMEKEEPING DEVICES (46 CFR 197.318):

22. Gauge Indicating Diver Depth at Surface-Supplied Dive Locations
23. Timekeeping Device at Each Dive Location

DIVING LADDERS AND STAGES (46 CFR 197.320):

24. Each Ladder Meets Structural, Material, and Installation Requirements
    (a) Available Where Required?
25. Each Diving Stage Meets Structural, Material, and Installation Requirements
    (a) Available Where Required?

SURFACE-SUPPLIED HELMETS AND MASKS (46 CFR 197.322):

26. Each Helmet/Mask Has Operating Non-return Valve, Exhaust Valve, and Two-Way Communication System
27. Each Helmet/Mask Meets Ventilation Requirements
28. Each Harness Has Position Buckling Device and Attachment Point for Umbilical That Meets Standards

OXYGEN SAFETY (46 CFR 197.326):

29. Oxygen Equipment Designed For Use and Has Slow-Opening Shut-off Valve If Required

PLATE 49-4-1.1 (cont.)

YES NO

PVHO's - GENERAL (46 CFR 197.328):

30. Contracted for or Purchased After 2/1/79, and Built and Stamped Per ASME Code
31. Contracted for or Constructed Before 2/1/79, not USCG- approved and Meets Requirements of 46 CFR 197.328(b),(c), and (d)
32. Contracted for or Constructed Before 2/1/79, USCG- approved and Meets Standards of NVC 2-70 and 46 CFR 61.10

PVHO's - CLOSED BELLS (46 CFR 197.330):

33. Meets Requirements of 46 CFR 197.330(a)
34. Meets Requirements of 46 CFR 197.330(b) in lieu of (a)(3), (a)(4), or (a)(5)

PVHO's - DECOMPRESSION CHAMBER (46 CFR 197.332):

35. Meets Requirements for Internal Dimensions, Ingress and Egress, Illumination, Visibility, and Habitability
36. Meets Requirements for Pressure Capability, Pressurization and Decompression, and Ventilation
37. Has Require External Pressure Gauge(s)

OPEN DIVING BELLS (46 CFR 197.334):

38. Meets Requirement for Breathing Mixture in Upper Section, and Has Umbilical
39. Lifting Equipment Meets Requirements
40. Meets Corrosion-Resistance Standards

PRESSURE PIPING (46 CFR 197.336):

41. Meets ANSI Code
42. Point of Connection to Vessel or Facility System Clearly Marked
43. Tested Every 12 Months or After Repairs, etc.

COMPRESSED GAS CYLINDERS (46 CFR 197.338):

44. Storage and Protection Standards Met
45. Tested Every 12 Months or After Repairs, etc.
46. Hydrostatically Tested Within 5 Years

PLATE 49-4-1.1 (cont.)

YES NO

BREATHING GAS SUPPLY (46 CFR 197.340):

47. Sufficient to Supply Diver and Standby Diver
48. Sufficient to Supply Decompression Chamber, Closed, or Open Bell When Provided or Required
49. Secondary Supply Adequate for Diver, Standby Diver, Decompression Chamber, Closed, or Open Bell as Required
50. Diver-Carried Reserve Supply Adequate
51. Primary and Diver-Carried Reserve Supply for SCUBA Diving Sufficient
52. Oxygen, Nitrogen, Helium, and Compressed Air Meet Standards

BUOYANCY-CHANGING DEVICES (46 CFR 197.342):

53. Connected to Helmet Exhaust Valve or Has Independent Exhaust Valve
54. Separate Inflation Source if Used for SCUBA Diving

INFLATABLE FLOTATION DEVICES (46 CFR 197.344):

55. Capable of Properly Supporting Diver; Has Manually-operated Inflation Device and Exhaust Valve, Oral Inflation Device, and Over-Pressure Relief Device

DIVER'S EQUIPMENT (46 CFR 197.346):

56. Each SCUBA Diver Has Required Equipment Available
57. Each Diver Using Heavyweight Diving Outfit Has Required Equipment Available
58. Each Diver Using a Lightweight Diving Outfit Has the Required Equipment Available
59. Primary, Secondary, and Diver-Carried Reserve Breathing Gas Supplies as Required by 46 CFR 197.346(e),(f), and (g)

PLATE 49-4-1.1 (cont.)

YES NO

PART C: OPERATIONS

RESPONSIBILITIES OF PERSON-IN-CHARGE (46 CFR 197.402):

1. Cognizant of 46 CFR 197, subpart B
2. Receives Report on All Required Details of All Planned Dives
3. Insure Rapid Communications, Emergency Boat and Crew for Diver Pickup, and Coordination of Activities as Required

RESPONSIBILITIES OF DIVING SUPERVISOR (46 CFR 197.404):

4. Cognizant of 46 CFR 197, subpart B and Operations Manual
5. Provides Planning Report to Person-in-Charge for All Diving Operations
6. Provides Notification of Any Diving-Related Casualty, Accident, or Injury

DIVE PROCEDURES (46 CFR 197.410):

7. Dive Team Members Briefed Properly Before Each Dive
8. Depth, Bottom Time Profile Maintained At Dive Location For Each Diver During the Dive
9. Two-way Communications Systems as Required
10. Dive Debriefing Procedures Rigorously Observed
11. Special Required Procedures For Dives Outside the No-decompression Limits, and For Decompression Sickness, Are Observed
12. Diving Supervisor Terminates Dives in Accordance With Requirements and Safe Practice

OPERATIONS MANUAL (46 CFR 197.420):

13. Provided to Person-in-Charge and Available at Dive Location as Required
14. Provides for All Specific Diving Operations Conducted, or Has Been Modified to Accomodate Adaptations
15. Provides for Safety and Health of Divers and Contains Required Safety Procedures and Checklists, Dive Team Member Assignments and Responsibilities, Equipment Procedures/Checklists, and Emergency Procedures

PLATE 49-4-1.1 (cont.)

YES NO

PART D: SPECIFIC DIVING MODE PROCEDURES

1. SCUBA Diving Safety Procedures Observed(46 CFR 197.430)
2. Surface-Supplied Air Diving Procedures Properly Observed(46 CFR 197.432)
3. Surface-Supplied Mixed-Gas Diving Procedures Properly Observed (46 CFR 197.434)
4. Lifeboating Safety Procedures Properly Followed (46 CFR 197.436)

PART E: PERIODIC TESTS AND INSPECTIONS OF DIVING EQUIPMENT

1. Required Samples and Tests are Performed of Breathing Gases and Air Compressors Regarding Quality, Quantity, Noxious or Offensive Odors, and Oxygen Percentage
2. Oxygen Equipment is Cleaned of Flammable Materials as Required (46 CFR 197.452)
3. Medical Kits are Checked Monthly and All Required Supplies Are Present (46 CFR 197.454)
4. Breathing Supply Boxes are Properly Tested, Inspected, and Stored (46 CFR 197.456)
5. Depth Gauges and Timekeeping Devices are Properly Tested and Inspected (46 CFR 197.458)
6. Diving Equipment Required is Inspected Before Each Dive By the Diving Supervisor (46 CFR 197.460)
7. Tests and Examinations of Pressure Vessels and Pressure Piping are Made Every 12 Months and After All Repairs or Modifications, in Accordance With Requirements and ASME and ANSI Codes.
8. All Required Log Entries Made and Log Maintained by Diving Supervisor

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A

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